UF

CrossLink

FALL 2021

GLOBAL HEALTH

BIOMEDICAL ENGINEERING SOLUTIONS WITH GLOBAL IMPACT

BIOMEDICAL ENGINEERING *at the* UNIVERSITY *of* FLORIDA

MALACHOWSKY HALL
FOR DATA SCIENCE & INFORMATION TECHNOLOGY

A 263,000-square-foot academic building located in the heart of UF's main campus that will connect students and researchers from across disciplines and create a hub for advances in computing, communication and cyber-technologies with the potential for profound societal impact.

KEY FEATURES

- Located in the heart of campus and at the center of the engineering buildings, co-located with medicine, pharmacy and bioinformatics to create multidisciplinary solutions to the world's greatest challenges
- Headquarters for the Department of Computer & Information Science & Engineering, Department of Electrical & Computer Engineering, the Florida Institute for Cybersecurity and the Warren B. Nelms Institute for the Connected World
- Interdisciplinary hub for collaboration in data science and cyber systems
- State-of-the-art artificial intelligence, machine learning and innovation with our growing strengths
- Exciting new maker spaces for virtual reality, Internet of Things and robotics.

CENTRALLY LOCATED IN THE HEART OF CAMPUS

INCLUSIVE ENGINEERING = GLOBAL IMPACT

Welcome to the 8th issue of CrossLink, a magazine dedicated to research and education activities of the J. Crayton Pruitt Family Department of Biomedical Engineering at the University of Florida.

This past year has forced us all to think creatively, consider new possibilities, and work together toward the promise of a healthier, safer tomorrow.

I am proud of our commitment to evolve constantly. Since our department was formed in 2002, we have weathered hard times and celebrated success through many cycles. One thing that has always remained constant is the integrity of our faculty, students, and staff. It is through the dedication and hard work of our entire team that I am proud to announce that our BME undergraduate program is now ranked #13 among public institutions, after only being formally accredited in 2019.

The theme of this year's CrossLink is global health, highlighting how our outstanding faculty and students are working together to tackle today's most challenging problems.

The cover story starting on page 8 explores cutting-edge research into global health – words that have become so prevalent for a multitude of reasons. Here we spotlight a few of the outstanding efforts our faculty and trainees are taking to tackle global health issues.

To maintain a global perspective, our department remains fully committed to diversity and building the STEM pipeline with formal and informal programs that create a supportive and inclusive community. On pages 16 and 17, read how Drs. Rashidi and Furtney are enhancing diversity and outreach efforts in creative ways.

We are also expanding our department by hiring new faculty (see page 25), increasing our student population, developing new educational programs and growing our research activities to address even more of today's challenges.

I may be a little biased, but I think you will agree that our incredible students featured on pages 20 and 21 are part of a change for a better world. They are designing and building thoughtful new devices, instruments, and techniques to treat people suffering from injuries and diseases.

The J. Crayton Pruitt Family Department of Biomedical Engineering received gifts from the Adenbaum Foundation, George and Irene Harper (friends of the department), and Todd Goede (UF alumnus and BME alumni board member) to support nationally competitive local experiential learning opportunities for students.

This issue of CrossLink tells a larger story – one of research, discovery, collaboration, and entrepreneurial spirit. As you will read, our department is impacting the community in so many meaningful ways.

Our actions have already made a difference and we are just at the beginning of what our combined efforts can do to meet the world's needs.

> "THE THEME OF THIS YEAR'S CROSSLINK IS GLOBAL HEALTH - OUR FACULTY AND STUDENTS ARE WORKING TOGETHER TO SOLVE SOME OF TODAY'S MOST CHALLENGING PROBLEMS."

Sincerely,

CSchmidt

Christine E. Schmidt
Professor, J. Crayton Pruitt Family Chair and Department Chair

CrossLink

A publication of the J. Crayton Pruitt Family Department of Biomedical Engineering at the University of Florida

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UF BME STAFF:
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Engineer II

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WEBSITE
BME.UFL.EDU

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BEST BIOMEDICAL ENGINEERING GRADUATE PROGRAM AMONG PUBLIC INSTITUTIONS
2022 U.S. News & World Report

SELECT STUDENT AWARDS + RECOGNITIONS

Two UF BME PhD candidates were selected for an Attributes of a Gator Engineer Award **- Madison Temples**: Professional Excellence and **Shreedevi Kumar**: Award for Integrity

Camara Casson first-place award poster competition at the NSF REU for Engineered Bioactive Interfaces and Devices at the University of Kentucky

Taylor Yeater awarded the Madelyn Lockhart Dissertation Fellowship from the Association for Academic Women at the University of Florida

Nine UF BME undergraduate students selected to the 2021 University Scholars Program **(Paxton Guerin, Anna-Sophia Hadley, JiHo Han, Nisha Kotta, Kendall Moran, Catalina Morrison, Brianna Pawlyshyn, Taylor Rakauskas** and **Gianna Sweeting)**

Sophia Saenz received a 2021 Cato T. Laurencin Student Travel Fellowship through the Society For Biomaterials (SFB)

Yasniary Morales and **Gianna Sweeting** selected as a Fernandez Family Scholar by the Herbert Wertheim College of Engineering

PRESTIGIOUS TRAINEE FELLOWSHIPS

F31 FELLOWS


Robert Accolla


Angelie Rivera-Rodriguez


Magdalena Samojlik

TL1 FELLOWS


Sarah Long


Kyle See

T32 FELLOWS


Alexander Kwiatkowski


Sebastian Barrutia


Erika Piner, Ph.D.


Magdalena Samojlik


Jennifer Simonovich

NSF GRADUATE RESEARCH FELLOWS


Leilani Astrab


Max Diaz


Joseph Ficarrotta


Aria Henderson


Angela Jimenez


Yan Carlos Pacheco

2021-2022 DISTINGUISHED LEADERSHIP SEMINAR SPEAKERS

RAPHAEL C. LEE, M.D., SC.D.
Paul and Allene Russell Distinguished Service Professor in the Departments of Surgery & Medicine, University of Chicago Medicine

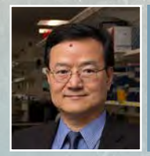
JAMES J. COLLINS, PH.D.
Termeer Professor, Biological Engineering and Institute for Medical Engineering & Science, Massachusetts Institute of Technology

FRANCES LIGLER, D.SC.
Ross Lampe Distinguished Professor of Biomedical Engineering, Joint Department of Biomedical Engineering, UNC Chapel Hill & NC State University

2020-2021 DISTINGUISHED LEADERSHIP SEMINAR SPEAKERS

JENNIFER H. ELISSEEFF, PH.D.
Morton F. Goldberg Endowed Professor of Ophthalmology, Director, Translational Tissue Engineering Center, Johns Hopkins University
Lessons in Translation: How Clinical Experience Guides Discovery in Regenerative Medicine

DAWN M. ELLIOTT, PH.D.
Blue and Gold Distinguished Professor & Department Chair, Biomedical Engineering, University of Delaware
Multiscale Mechanics of Musculoskeletal Tissues



BIN HE, PH.D.
Trustee Professor of Biomedical Engineering, Carnegie Mellon University
Dynamic Human Brain Imaging and Brain-Computer Interface

RODERIC PETTIGREW, PH.D., M.D.
Chief Executive Officer of Engineering Health & Executive Dean for Engineering Medicine, Texas A&M University / Houston Methodist Hospital
Engineering Better Medicine for Public Health Crises

SHELLY SAKIYAMA-ELBERT, PH.D.
Professor and Department Chair of Biomedical Engineering, The University of Texas at Austin
Biomaterials for Drug Delivery and Cell Transplantation to Treat Nerve Injury

MAJOR FACULTY AWARDS + RECOGNITIONS

Dr. Kyle Allen received the HWCOE 2021 Faculty Excellence in Leadership Award

Dr. Wesley Bolch awarded both the HWCOE and UF Level Doctoral Dissertation Advisor/Mentor Award

Dr. Wesley Bolch appointed as Full Member, Radiation Therapy and Radiobiology (RTB) Study Section of NIH

Drs. Wesley Bolch and **Aysegul Gunduz** awarded UF Term Professorship

Dr. Ruogu Fang invited to serve as a member of the Editorial Board for the Journal Medical Image Analysis

Dr. Meghan C. Ferrall-Fairbanks selected to participate in the National Academy of Engineering's German-American Frontiers of Engineering Symposium (GAFOE) 2021

Dr. Sarah Furtney received HWCOE 2021 Faculty Advisor/Mentor of the Year Award

Dr. Walter Lee Murfee elected president of Alpha Eta Mu Beta International Biomedical Engineering Honors Society

Dr. Aysegul Gunduz inducted into the 2020 class of the UF Graduate School Edward Alexander Bouchet Graduate Honor Society

Dr. Edward A. Phelps received 2021 HWCOE and UF Excellence Award for Assistant Professors

Dr. Christine E. Schmidt elected to Academy of Science, Engineering and Medicine of Florida

Dr. Cherie Stabler awarded Integra LifeSciences Term Professorship, elected to serve as President-Elect for the Americas Chapter of TERMIS

Drs. Ivana Parker, Brittany Taylor and **Lakiesha Williams** listed Among 100 Inspiring Black Scientists in America by Cell Mentor

KEY RESEARCH ADVANCES + INNOVATION

Dr. Wesley Bolch received an NIH National Cancer Institute grant titled, "Developing Whole-body Computational Phantoms for Blood Dosimetry to Model the Impact of Radiation on the Immune System" for $1.2 million

Dr. Wesley Bolch received a Department of Defense PRMRP grant titled, "Aligning Dosimetry and Biomarkers of Lung Injury with Prophylaxis and Mitigation of Damage from Radionuclides and Metals" for $1.6 million

Dr. Mingzhou Ding received an NIH NIMH grant titled, "Acquisition, Extinction, and Recall of Attention Biases to Threat: Computational Modeling and Multimodal Brain Imaging" for $2.3 million

Dr. Ruogu Fang received an NIH NIA RF1 grant titled, "Mechanisms, Response Heterogeneity and Dosing from MRI-derived Electric Field Models in tDCS Augmented Cognitive Training: A Secondary Data Analysis of the ACT Study" for $2.9 million

Dr. Edward Phelps received an NIH R01 NIDDK grant titled, "Mechanism and Dynamics of Islet GABA Signaling" for $1.8 million

Dr. Parisa Rashidi received an NIH NINDS grant titled, "ADAPT: Autonomous Delirium Monitoring and Adaptive Prevention" for $3.7 million

Dr. Parisa Rashidi received an NIH NIBIB R01 grant titled, "Intelligent Intensive Care Unit (I2CU): Pervasive Sensing & Artificial Intelligence for Augmented Clinical Decision-making" for $3.8 million

Dr. Cherie Stabler received an NIH cooperative agreement "Engineering a Human Microphysiological System for the Characterization of Islet-Immune Interactions" for $1.7 million

Dr. Cherie Stabler received an NIH NIDDK grant titled, "Engineering Immunomodulatory Nanoscale Coatings for Protecting Islet Transplants" for $5.1 million

Biomedical Engineering Solutions with Global Impact

BY DIANE CHOATE

ADDRESSING GLOBAL HEALTH INVOLVES TAKING INTO CONSIDERATION VARIED GEOGRAPHICS, DEMOGRAPHICS, CULTURES, ECONOMIC DISPARITIES, AND EVEN POLITICS. BECAUSE ENGINEERS ARE DRIVEN TO LOOK AT ALL KINDS OF SOLUTIONS TO A PROBLEM, THEY ARE ALWAYS INVOLVED IN FINDING ANSWERS TO GLOBAL HEALTH ISSUES.

ADVANCING GLOBAL HEALTH THROUGH ENGINEERING

UF BIOMEDICAL ENGINEERING RESEARCHERS ARE WORKING TO FIND MORE SOLUTIONS FOR TESTING, TREATMENT, CURES AND/OR PREVENTION IN A VARIETY OF AREAS.

>>> HIV/AIDS:

Generation X (those born between the 1960s and 1980s) may recall HIV/AIDS as the most prominent threat to the health of the world's populace. Since the beginning of the epidemic, the World Health Organization (WHO) has recorded almost 80 million people infected with the HIV virus, and about 37 million people have died of AIDS. Globally, 37.7 million people were living with HIV at the end of 2020.

IVANA PARKER, PH.D.
ASSISTANT PROFESSOR

Trained immunity, HIV prevention, proteomics and systems biology

Engineering research into HIV/AIDS continues today. **Ivana Parker, Ph.D.,** assistant professor at UF Biomedical Engineering (BME), has been studying HIV/AIDS and its co-morbidities since her graduate school days. During her Ph.D. work, she began studying cardiovascular disease associated with the long-term use of anti-retroviral drugs used to treat HIV patients. During a trip to Ethiopia to quantify HIV-related co-morbidities in sub-Saharan Africa, where there is less access to newer combinations of therapy, she determined that the use of first-line therapies led to increased co-morbidities, especially in women and children.

As part of a Fulbright scholarship, she worked in southern Africa, studying the risk of a commonly used TB vaccine, BCG, on HIV transmission from mothers to infants. Using her engineering knowledge, she developed a platform using cultured macrophages to discover protein markers that were important in understanding the inflammatory responses to BCG and their role in HIV transmission. Employing computational analyses and systems biology approaches, Parker aims to predict which patients would be more at risk.

Parker's research deals with developing models that can be used to understand and predict inflammation related to HIV risk without having to repeatedly do large patient cohort studies. "I hope to incorporate AI and machine learning techniques in the future. The university's AI Initiative was a major factor in my decision to join the BME faculty at UF," Parker said. Parker is also currently working to better understand the nuances in vaginal health and bacterial vaginosis, a condition that is not well-defined or well-treated globally. Her aim is to establish a healthy vaginal biome to reduce the spread of HIV.

> **IF WE CAN DETERMINE RISK FACTORS AND COME UP WITH THERAPIES THAT PREVENT DISEASE RATHER THAN HAVING TO TREAT IT, WE CAN EASE THE COST BURDEN. THIS IS WHERE WE CAN IMPACT GLOBAL HEALTH.**
> - Ivana Parker

RUOGU FANG, PH.D.
ASSISTANT PROFESSOR

Big data analytics, brain informatics, medical image analysis

>>> ALZHEIMER'S DISEASE AND DEMENTIA:

The World Health Organization estimates that, worldwide, around 50 million people have dementia; and there are nearly 10 million new cases every year. This number is expected to triple by 2050 as our global population ages. Alzheimer's disease is the most common form of dementia and may contribute to 60–70% of cases. The cost, due to loss of productivity and the need for constant caregivers, runs into the billions of dollars.

BME assistant professor **Ruogu Fang, Ph.D.,** through her Smart Medical Informatics Learning & Evaluation (SMILE) lab, is working to integrate AI as an engineering tool to find solutions for Alzheimer's and related dementias. She and her colleagues are researching two approaches – (1) early and pervasive diagnosis and (2) effective intervention at an early stage. For (1), retinal imaging device is much cheaper ($6K vs. $1-4M) compared to conventional imaging diagnostic scanners (MRI, PET). Thus the cost of each test will also be much more accessible globally. For (2), transcranial direct current stimulation (tDCS) is a light-weight, affordable, non-invasive brain stimulation method that has the potential to be administered at home or community hospitals.

The retina of the eye has the same origin as brain cells, thus allowing insight into what is happening in the brain through studying this tissue before overt symptoms of neuronal disease become apparent. Using a book-sized retinal camera that can be carried easily, Fang's technology will allow healthcare workers to gather retinal images anywhere. Artificial intelligence (AI) can then be implemented to analyze and classify patients with Alzheimer's years before the disease has progressed to overt symptoms.

Even with early diagnosis, there is no cure for Alzheimer's and related dementias yet. Fang is working with Adam Woods, Ph.D., and his colleagues at the UF College of Public Health & Health Professions to integrate AI and transcranial direct current stimulation (tDCS), paired with cognitive training, to tailor precision therapy for the individual that can prevent further cognitive decline.

"Educating and mentoring students in the multidisciplinary fields of medicine and engineering is how we will open up the future for improvements in global health and welfare," Fang said.

>>> RHEUMATOID ARTHRITIS:

Jamal Lewis, Ph.D., associate professor in BME (starting Summer 2022), who worked with Benjamin Keselowsky, Ph.D., BME professor and associate chair for graduate studies, on the development of a vaccine that could be used to train a diabetic's immune system not to attack its beta cells, has expanded his research into the field of rheumatoid arthritis (RA). World Health Organization data estimated that more than 23 million people globally lived with RA in 2014. This condition is an autoimmune form of arthritis in which the body's immune system attacks its own joints and connective tissue, causing inflammation, swelling, and joint damage. The prevalence of RA by 2030 may be over 65 million as the baby boomer population in the US ages and RA is increasingly diagnosed in underdeveloped countries.

Lewis' research focuses on trying to suppress the autoimmune attack, with the aim of eventually developing a regulatory vaccine that could be given to at-risk people before they develop full-blown RA. Drawing on his experience in biomaterials engineering, Lewis will be using vaccine-loaded microparticles to suppress inflammation and prevent the loss of collagen in a patient's joints and bones. He hopes that success in this arena could lead to a platform for developing a broad-spectrum vaccine for all types of autoimmune diseases.

On a larger scale, Lewis has begun studying vomocytosis, the process by which some fungal cells can be ingested by immune cells without being harmed and can then be expelled from the immune cells in areas like the brain and lymph nodes. By studying the activity of these fungal cells, Lewis aims to adapt the process to inanimate microparticles as a form of site-specific drug delivery. Such a development could help people everywhere with many types of diseases.

“OUR GOAL IS TO TRANSLATE BIOMATERIALS-BASED IMMUNOTHERAPIES TO THE CLINIC TO GLOBALLY IMPACT THE PANDEMIC OF AUTOIMMUNITY.”

- Jamal Lewis

JAMAL LEWIS, PH.D.
ASSOCIATE PROFESSOR

Biomaterials, drug delivery, immunoengineering

>>> OSTEOARTHRITIS:

JENNIFER NICHOLS, PH.D.
ASSISTANT PROFESSOR

Biomechanics, musculoskeletal modeling, predictive simulation, medical imaging

Osteoarthritis, a condition brought about by common wear and tear on joints, affects more than 240 million people worldwide, according to the Osteoarthritis Research Society International (OARSI). In a report to the FDA, they stated that osteoarthritis, with a 75% increase in Years Lived with Disease (YLD), ranked as the third most rapidly rising condition associated with disability (just behind diabetes with a 135% increase and dementia with an 84% increase). The personal and societal costs of osteoarthritis are significant and ever-increasing with an aging population.

BME assistant professor **Jennifer Nichols, Ph.D.,** is working on the goal of creating predictive, biomechanical simulations to improve the functional ability and quality of life for individuals with musculoskeletal disorders, including osteoarthritis.

Nichols creates computer models that replicate how the musculoskeletal system responds to pathologies and treatments. “If we can predict the most efficacious treatments, we can adjust and improve therapies for OA,” Nichols said. Her long-range goal is to develop tailored models from limited data that are patient-specific. While therapy and surgery are well advanced in high-income countries, options in lower/middle-income countries are more limited. The models developed by Nichols will be open-sourced so that clinicians around the world can use them.

“IN THIS ERA OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING, WITH THE ABILITY TO GET DATA FROM GROUPS EVERYWHERE, WE CAN HARNESS THAT DATA TO DESIGN SOLUTIONS THAT WORK FOR EVERYBODY REGARDLESS OF CULTURAL BACKGROUNDS AND GEOGRAPHICAL LOCATIONS.”

- Jennifer Nichols

>>> GLOBAL IMPACTS OF THE GUT MICROBIOME ON HEALTH:

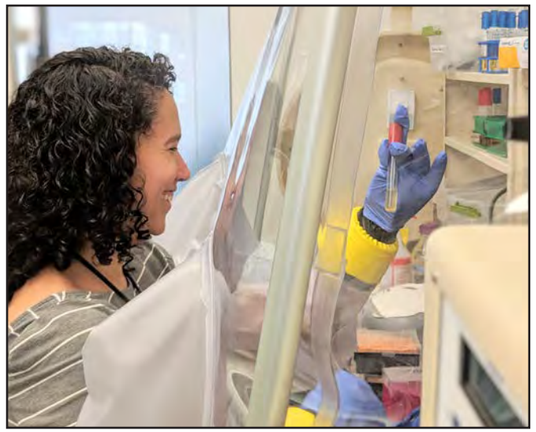
ANA MARIA PORRAS, PH.D.
ASSISTANT PROFESSOR

Biomaterials & tissue engineering to study host-microbe interactions and inclusive science communication

Assistant professor **Ana Maria Porras, Ph.D.,** who joined BME this fall, is tackling global health conditions that impact many health issues. “The gut microbiome within the body is widely varied, depending on what part of the world you live in,” Porras said. “Currently, we don’t know if microbiome-based treatments developed in the United States will work efficaciously for populations elsewhere in the world due to these differences, which are not well understood.”

Porras’ approach involves creating in vitro models of tissues like the gut and subjecting these customized biomaterials to well-known and emerging pathogens to study human-microbe interactions. Her aim is to understand how and why these different biomes react in different ways to health threats.

> **ENGINEERS ARE IN THE BUSINESS OF SOLVING PROBLEMS. IF WE WANT THE SOLUTIONS WE ENGINEER TO SERVE THE WORLD, WE NEED TO BE INCLUSIVE. WE MUST UNDERSTAND THE WORLD IF WE ARE GOING TO REACH EVERYONE EVERYWHERE TO IMPROVE HEALTH GLOBALLY.**
> - Ana Maria Porras



>>> STUDENT ENGAGEMENT IN GLOBAL HEALTH:

Instructional assistant professor **Eric Fuller, Ph.D.,** is the main instructor of the Senior Student Design Project in the Department of Biomedical Engineering. He incorporates aspects of global health needs into the 16 projects he provides to senior BME students for this capstone class each year.

Students choose one of the projects to work on: for example, a more comfortable prosthetic liner for amputees to encourage continued use of the prosthetic. Other projects from the past year involved designing inexpensive3-D bioprinters to produce novel surgical products and re-engineering common pool floats for unique aquatic physical therapy exercises.

While discussing engineering approaches with the students, Fuller emphasizes employing “frugal engineering” that asks the students to consider using inexpensive and readily available materials in their solutions. Making economically feasible products is as important as any other aspect of the design and has a vital global impact.

In the future, Fuller’s aspiration is to incorporate project partners from lower/middle income countries so that students can have closer interaction with global needs and see firsthand the global impact their designs can have.

> **FRUGAL INNOVATION IS CRITICAL FOR GLOBAL HEALTH, AND OUR STUDENT ENGINEERS ARE WELL TRAINED AND POISED TO MAKE THIS HAPPEN.**
> - Eric Fuller

UF IN BRAZIL: GLOBAL ENGINEERING EDUCATION

Dr. Eric Fuller is the program director for the Summer 2022 engineering internship abroad program that is organized by the Herbert Wertheim College of Engineering to increase student engagement in international experiences through a unique study tour and internship program for engineers, including chemical engineers and biomedical engineers.

The program provides a unique opportunity to learn about Brazilian history, culture and technology while completing an engineering internship at a company in São Paulo. Students will have the opportunity to learn and develop their professional and intercultural competencies in a global environment.

This program will take place in São Paulo and Rio de Janeiro to leverage Brazil’s strong position in chemical, petrochemical, and biochemical industries. Working as an intern enables students to connect theory with practice and apply the engineering and scientific principles learned in the classroom to a real-world professional environment. Completing an internship abroad is an invaluable opportunity to learn about local business and engineering practices and customs, hone personal and professional skills and habits and broaden perspectives.

ERIC FULLER, PH.D.
INSTRUCTIONAL ASSISTANT PROFESSOR

Engineering design and engineering education

INSPIRING A DEEPER CURIOSITY FOR LEARNING

The UF BME department is committed to the idea that education should influence people's lives beyond the boundaries of the classroom. Through various pre-college, undergraduate and graduate outreach initiatives and programs, the department aims to educate and inspire future leaders in engineering.

Sarah Furtney, Ph.D., instructional assistant professor and undergraduate coordinator, approaches engaging with undergraduates by treating them not simply as students but as early career professionals. Her teaching strategies significantly overlap with mentoring and advising. She fosters a classroom environment that excels in teamwork and collaboration – she places as much energy into her classroom as to building educational outreach activities for students from K-12.

Furtney collaborates across campus with the Herbert Wertheim College of Engineering to support and promote the success of the Florida Engineering Experiment Station (FLEX) and to increase the diversity of tomorrow's technology leaders by promoting the success of pre-collegiate institutions and their students.

When Furtney is invited to collaborate, she involves BME undergraduate students in her Cellular Laboratory class to help mentor the K-12 students. She tailors the outreach to the activity, "what are the learning objectives and how can I align our students with teaching activities in a fun and engaging way," she said.

"It is also beneficial that students see females with a successful STEM career since girls too often don't see themselves reflected in STEM professionals," she said. Research shows that children learn better from those who look like them.

Incorporating more hands-on learning activities is one sure-fire way to boost student interest in STEM. Allowing students to build a robot, conduct experiments, or take a STEM-related field trip can increase their desire to succeed in math and science class.

STEM education stresses the value of failure as a learning exercise, which will enable students to embrace mistakes as part of the learning process. Students are also taught skills that they can use in the real world. "My goal is to engage with the students and get them excited about engineering and provide inspiration. This motivates students to learn; the skills that they acquire can be utilized immediately," she said.

> **TO FULLY PARTICIPATE IN TODAY'S SOCIETY, ALL STUDENTS, REGARDLESS OF RACE, GENDER OR ECONOMIC STATUS, REQUIRE A STRONG UNDERSTANDING OF STEM.**
> - Sarah Furtney

If you or your company would like to donate products or devices for future K-12 outreach, please email Dr. Furtney at furtney@bme.ufl.edu.

USING ARTIFICIAL INTELLIGENCE TO EVALUATE EQUITY IN HEALTHCARE DELIVERY

Artificial intelligence (AI) and machine learning (ML) are being used more frequently today to categorize and analyze healthcare data. For instance, **Parisa Rashidi, Ph.D.,** associate professor, UF Term Professor and J. Crayton Pruitt Family Endowed Fellow in the UF Department of Biomedical Engineering, with her postdoctoral associate, Benjamin Shickel, Ph.D., used these tools to assess continuous-monitoring sensors in intensive care units. During the study, the researchers collected data and subsequently analyzed it using algorithms developed by Rashidi and her engineering students. "AI technology could assist not only in administering repetitive patient assessments in real-time, but also in integrating and interpreting these data sources with electronic health record (EHR) data, thus potentially enabling more timely and targeted medical interventions," Rashidi said.

PARISA RASHIDI, PH.D.
ASSOCIATE PROFESSOR & J. CRAYTON PRUITT FAMILY TERM FELLOW

Machine learning, data mining, big data and biomedical informatics

In the healthcare field, these algorithmic predictions can have life-or-death consequences. Using ML models to support clinical decisions such as mortality prediction and surgical risk, and even aiding in emergency triage, can affect the use of a hospital's resources and can also have a direct impact on patient outcomes.

"Left unchecked, these data-driven algorithms have the potential to inadvertently perpetuate or even compound structural inequities in healthcare," Rashidi said. "If biases exist in the data used to train the machine learning models, these biases will be reflected in the models' predictions, potentially leading to biased clinical implementation that results in even more biased data."

> **OUR ONGOING WORK WILL ATTEMPT TO DISCOVER AND CATEGORIZE THE SOURCES OF BIAS IN ELECTRONIC HEALTH RECORDS AND DEVELOP METHODS FOR BALANCING OUR FRAMEWORKS TO PROVIDE MORE EQUITABLE TREATMENT TO ALL PROTECTED GROUPS.**
> - Parisa Rashidi

Bias in the healthcare data can come from many sources. For example, data from minority groups could be underrepresented, leading to models that are less accurate for treating these patients. Improving the fairness of clinical machine learning systems and ensuring equitable treatment to patients from a wide collection of protected groups is an active area of research.

Rashidi and her postdoctoral associate are currently involved in research into AI and ML and their effects on fair clinical predictions. In a recent study that employed deep learning models for predicting both short- and long-term patient mortality risk, Rashidi and her group evaluated how well their models provided fair predictions for patients from several sensitive sociodemographic groups (gender, race, ethnicity, rural populations, marital status, primary spoken language, insurance status, neighborhood poverty rate). Although overall accuracy of the ML models was high, the study results suggested a large demographic inequality between insurance statuses (favoring insured patients) and a moderate inequality between grouped ethnicities (favoring non-Hispanic patients).

Real-world applications of artificial intelligence should ensure fairness to protected groups. "Our preliminary results are useful in highlighting one example of the subtle manifestations of unfair machine learning in healthcare," Rashidi said.

COMMUNICATING SCIENCE THROUGH CROCHETED MICROBES Q&A with Dr. Porras

Ana Maria Porras, Ph.D., is an assistant professor who has recently added her knowledge and expertise to the UF Department of Biomedical Engineering, where she is studying differences in the human gut microbiomes of different populations around the world. Porras is very involved in the community as well as her research. She is using her bilingual expertise to reach out in English and Spanish to help people understand how our bodies protect and preserve our health.

PORRAS RECENTLY ANSWERED SOME OF OUR QUESTIONS ABOUT HOW SHE USES THE ART OF CROCHETING TO COMMUNICATE ABOUT SCIENCE TO PEOPLE OF ALL AGES.

1

What first fueled your interest in science communication?

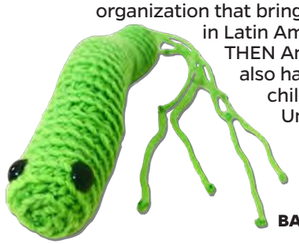
I was always curious about developing approaches to explain my scientific work in ways that are accessible to more people, but I did not become more intentional about it until my postdoctoral position. For my postdoc, I switched research fields and started learning about microbiomes for the first time. That opened my eyes to how important the microbes around and within us really are. As I learned more, I wanted to share that information with others. I formally started #MicrobeMondays in English in April 2018 and soon after realized (thanks to a cousin) there was a dearth of resources available in Spanish. Since then, I have become a passionate advocate for multilingualism in science communication. I believe firmly that we must lower barriers of access to both STEM careers and scientific knowledge in general.

2

Who makes up your audience?

Everyone! To be more precise, my audience changes depending on the type of engagement. On my social media accounts, I'm usually interacting with adults that range from college students all the way to retirees. Interestingly, close to 70% of the people who follow me are women; I suspect this is both because I am a woman and because I use crafted arts, which have traditionally been associated with more feminine art forms.

Through my work with Clubes de Ciencia (an organization that brings science clubs to students in Latin America) and the AAAS IF/THEN Ambassadors program, I have also had a chance to connect with children and teenagers in the United States and Colombia.



BACTERIUM HELICOBACTER H. PYLORI

> **"I BELIEVE FIRMLY THAT WE MUST LOWER BARRIERS OF ACCESS TO BOTH STEM CAREERS AND SCIENTIFIC KNOWLEDGE IN GENERAL.**
> - Ana Maria Porras

3

How did you get the idea to use crocheted microbes to illustrate your communications?

I was invited to join "Team Microbiome" from Cornell University to attend the 2018 USA Science and Engineering Festival in Washington, DC. Since we were studying microbes, which, by definition, you cannot see with the naked eye, we needed another way to attract attendees to our booth. I had been crocheting for many years and had the idea to crochet a few bacteria. The colorful microbes were a hit; and, from that point, I understood the power of art in visualizing complex concepts, crossing cultural barriers, and making visible that which we cannot see.

4

How do you communicate with your audiences?

I use primarily **Instagram**; but I have been trying to get into **TikTok** to reach younger audiences! I also sometimes collaborate with other science communicators, journalists, and organizations through other media like magazines and YouTube videos (**check out my Curiosity Camp collaboration with GoldieBlox**).

5

How long have you been an active science communicator?

In addition to starting #MicrobeMondays (@AnaMaPorras) in April 2018, I initiated #MicroMartes (**@anaerobias**) in May of the same year. I have also officially been one of the 125 AAAS IF/THEN Ambassadors for girls and women in STEM since October 2019.

6

Can you describe the differences between communicating in Spanish English?

Every communications plan needs to take the audience into account. Just like it is not the same to talk to your lab mates as it is to talk to your nieces and nephews, I have to adapt both the content and delivery of my messages to the audiences in each country. Things like cultural references, motivations or examples change quite a bit between cultures. Even the way we speak is different. English is much more to the point, whereas in Spanish we like to be verbose and provide a lot more context. It is really fun to switch between different modes of thinking!

I very much look forward to beginning to interact with the many Spanish speakers in the state of Florida. We have almost 2.5 million people who speak Spanish in our state (16.46% of the population), and I can't wait to develop new ideas to connect with them and share what we are doing at the J. Crayton Pruitt Family Department of Biomedical Engineering.

7

What kind of feedback do you get from your audiences, especially in your native Colombia?

Regardless of the country, people in general respond very positively to my crocheted microbes. I always like to say that I hook people with cuteness and then bring on the science. On top of talking about microbes, I also often use my platforms to highlight Colombian scientists and engineers all around the world. These profiles, in particular, get a lot of positive feedback – Latin Americans of all ages love to see themselves represented in what we do.

> **"I OFTEN USE MY PLATFORMS TO HIGHLIGHT COLOMBIAN SCIENTISTS AND ENGINEERS ALL AROUND THE WORLD. THESE PROFILES, IN PARTICULAR, GET A LOT OF POSITIVE FEEDBACK – LATIN AMERICANS OF ALL AGES LOVE TO SEE THEMSELVES REPRESENTED IN WHAT WE DO.**
> - Ana Maria Porras

RED BLOOD CELL NEXT TO BACTERIA FLAVONIFACTOR PLAUTII

SYNECHOCOCCHUS

STUDENT SPOTLIGHTS

GIANNA SWEETING
B.S. STUDENT
FANG LAB

- University Scholars Program (USP) Fernandez Family Scholar
- Herbert Wertheim College of Engineering (HWCOE) Scholarships
  - 2021 - 2022 John & Mittie Collins Engineering Scholarship
  - 2020 - 2021 recipient of Engineering College Scholarship

Gianna's current research topic focuses on using genomic data to discover genetic variants that can be associated with the development of Alzheimer's disease. Currently she is learning how to use genomic analysis tools such as PLINK and GWAS as well as understanding which features should be extracted in hopes of aiding a machine learning algorithm focused on identification and prediction of AD.

She considers this research important as it can help lead to early diagnosis and intervention before deteriorating or fatal effects.

SAMANTHA ALI GHANDOUR
M.S. STUDENT
ALLEN LAB

- University of Florida Latin American Scholarship
- University of Florida Caribbean Scholarship

Samantha's current research for her master's project under the mentorship of Dr. Kyle Allen and in collaboration with Dr. Peter McFetridge focuses on the effects of an emerging therapeutic — human placental-derived matrix (hPM)— on osteoarthritic knees in rodent models. Their final goal is to study the effects of hPM in osteoarthritis-related pain behaviors and inflammatory pathways. She has also collaborated with Dr. Mei He, UF assistant professor, College of Pharmacy, on developing microfluidic technology for exosome gene delivery.

SAVANNAH DEWBERRY
PH.D. CANDIDATE
OTTO LAB

- NSF Graduate Research Fellowship
- Robert C. Pittman Nanoscience Institute for Medical and Engineering Technology (NIMET) Fellow, University of Florida
- Graduate Student Preeminence Award, University of Florida

Savannah is co-advised by Dr. Otto and Dr. Allen. She is studying neuromodulation of chronic pain syndromes and how chronic pain can be treated by electrical neural stimulation. Her work will potentially help develop bioelectric medicine options that are more targeted and flexible than current options.

Dr. Otto's lab works extensively with machine-tissue interfaces for electrical stimulation. Dr. Allen has extensive knowledge of the pathology and behavioral assays involved in chronic pain, especially osteoarthritis.

ANGELIE RIVERA-RODRÍGUEZ
PH.D. CANDIDATE
RINALDI-RAMOS LAB

- NIH NRSA F31 Individual Predoctoral Fellowship
- NSF Graduate Research Fellowship
- UF Graduate Student Fellowship

Angelie's research focuses on how magnetic nanoparticles can be used in cancer medicine and medical imaging. Magnetic nanoparticles are biocompatible functional materials that can be leveraged in a diversity of biomedical applications that take advantage of their magnetic properties. Their response to time-varying magnetic fields makes them of interest in imaging, diagnostic, and therapeutic applications.

Angelie has used in-house synthesized magnetic nanoparticles as heat actuators for thermal treatment in combination with chemotherapy to overcome drug resistance in breast cancer. Also, she uses magnetic nanoparticles as imaging tracers to label and track immune cells for brain cancer treatment using the novel medical imaging technology, Magnetic Particle Imaging.

MATT BECKER
PH.D. CANDIDATE
PHELPS LAB

- NIH NRSA F31 Individual Predoctoral Fellowship
- NIH NRSA T32 Training Grant for T1D research in BME and BMS programs
- Graduate Student Preeminence Award, University of Florida

A major goal of type 1 diabetes (T1D) is to develop an antigen-specific therapy capable of interrupting the autoimmune disease process in which autoreactive T cells selectively destroy insulin producing beta cells within the pancreas. Matt's research focuses on developing an antigen-specific, cell-free therapy for inducing immune tolerance in T1D while maintaining healthy systemic immunity, based on exosomes as carriers of immunological information. From this project, he seeks to generate off-the-shelf, patient-personalized therapies to expand personalized medicine to population scales.

TAYLOR YEATER
PH.D. CANDIDATE
ALLEN LAB

- NIH NRSA F31 Individual Predoctoral Fellowship
- University of Florida Association for Academic Women Emerging Scholar Award
- UF BME Supervised Teaching Excellence Award

Taylor's research focuses on the neurobiology of chronic pain. Specifically, she works with Dr. Kyle Allen to study the intersection of the autonomic nervous system and osteoarthritis progression.

She is interested in uncovering if and how osteoarthritis can contribute to changes throughout the body, beyond the affected joints. Improving our understanding of disease progression may lead to novel therapeutic approaches to improve the quality of life for those suffering from chronic pain.

New Philanthropic Donations Enable BME Summer 2021 Undergraduate Research Internships

The J. Crayton Pruitt Family Department of Biomedical Engineering received gifts from the Adenbaum Foundation, George and Irene Harper, and Todd Goede to support nationally competitive local experiential learning opportunities for students. The donations, which build on the Adenbaum Foundation's previous gifts, funded a new summer internship program for undergraduates. This fund was created to provide first time experiences for UF BME students and to meet the challenge of decreased opportunities due to the ongoing pandemic.

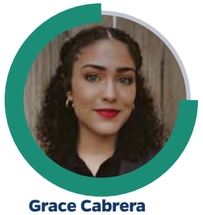
THE PROGRAM'S OBJECTIVES INCLUDE:

>>> To increase summer research opportunities for BME undergraduates.

>>> To provide an eight-week paid internship opportunity and meaningful career-related work experience.

>>> To expose students to research in a BME laboratory under the guidance of a BME faculty.

>>> To target rising seniors who have not benefited from similar experiences due to a lack of opportunities.



Grace Cabrera
Gunduz Lab

Vanessa Cruz
Ferris Lab

Aidan Fernandez
Stabler Lab

Cierra Gibson
Williams Lab

Matthew Rexroad
Sharma Lab

Andrew Sforza
Bolch Lab

John Teehan
Parker Lab

Industry Networking Opportunities for Students (2020-2021)

Working to promote the exchange of ideas among industry, students and faculty in the department brought experts from around the country to present the latest findings in industry news.

DUANE CHIN

Manager,
Medical Operations at
KBR/NASA, Houston, TX

(BS, Biomedical Engineering Sciences and Mechanics, University of Florida, 1999)

BRIAN DORN

Senior Intellectual Property Counsel at Arthrex, Inc, Naples, FL

(JD, Law, University of Florida, 2003, PhD, Molecular Biology, University of Florida, 2003)

ISHAN KULKARNI

Product Manager at
Yahoo,
San Francisco, CA

(MS, Biomedical Engineering, University of Florida, 2016)

SARAH MAYES

Chief Scientific Officer/
Co-founder at Alafair
Biosciences, Austin, TX

(MS, Materials Engineering, University of Michigan 2006, PhD, Biomedical Engineering, The University of Texas at Austin, 2013)

UF BME Advisory Board Member

ALINE NACHLAS

Associate at McKinsey &
Company,
San Francisco, CA

(BS, Biomedical Engineering, University of Florida, 2014, PhD, Biomedical Engineering, Emory University, 2019)

JEFFREY WILLIS

Chief Commercial Officer
at KitoTech Medical, Inc,
Atlanta, GA

(BS, Biomedical Engineering, University of Florida, 1996)

UF BME Advisory Board Member

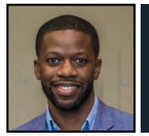
NELLY VOLLAND-LOCHNER

Lead Development
Engineer at GE Healthcare,
Florence, SC

(MS, Biomedical Engineering, University of Florida, 2003, PhD, Biomedical Engineering University of Florida, 2009)

Two BME Alumni Honored in 2021 "40 Under 40" Awards

Two UF BME alumni have been recognized by the university in this year's "40 under 40" awards, which honor outstanding young alumni whose achievements positively impact The Gator Nation® as they go greater in their communities and professions.



Jamal Lewis, Ph.D. (PhD, BME '12)
Associate Professor,
Department of Biomedical Engineering,
UC Davis
(Starting at UF BME Summer 2022)

Chelsea Magin, Ph.D. (BS, MSE, '06, MS, BME, '08, PhD, BME, '10)
Assistant Professor, Bioengineering,
Pediatrics and Medicine at the University of Colorado Denver - Anschutz

Alumni on Campus

Our alumni are involved in sharing experiences and wisdom with our current students on campus and helping shape the future of engineering in healthcare.

Dr. Bryan Conrad, Principal Researcher, Nike, Inc.

Jose Aguirre, VP Operations, Edwards Lifesciences

Industry Partners

PLATINUM

INTEGRA LIFESCIENCES — LIMIT UNCERTAINTY

GOLD

Edwards

SILVER

axogen
KLS martin GROUP
alafair BIOSCIENCES
MilliporeSigma
Exactech
rti surgical
stryker

Ryan Litzinger
Assistant Director of Development

If you would like more information on how to give to BME or become an industry partner, please contact Ryan Litzinger at **352-294-7947** or **rlitzinger@eng.ufl.edu**.

BME STUDENT LEARNING INS AND OUTS OF THE ORTHOPEDIC INDUSTRY

Melissa Isoba (BME B.S. Senior) spent this past summer learning the ins and outs of the orthopedic implant industry while completing an internship at Exactech. Headquartered in Gainesville, FL, Exactech is dedicated to improving patient outcomes for joint replacement surgery. Throughout the internship, she was able to make valuable connections, observe the cross-functionality of all departments, and build upon the engineering skills developed at the University of Florida. Working alongside the Supply Chain team, she collaborated with teams in the Quality, Engineering & Development, and Biologics departments. Seeing engineering projects from a Supply Chain view, she gained a new perspective on the development process from start to product launch.

Melissa adapted a children's toy to be more accessible for those with limb differences during an Adapt-a-thon event.

Her passion for implants began when she joined Generational Relief in Prosthetics (GRiP) in Fall 2019. GRiP is an on-campus organization that produces prosthetic assistive devices, adaptive games, and new products to make a difference in the lives of those with limb differences. It was because of GRiP that Melissa felt she had the technical skillset to pursue a career in the medical device field. As an Assistive Devices Captain, she led a team of six engineers in resizing CAD files to be 3D-printed and assembled into functioning prosthetics. With the rest of her time at the University of Florida, she plans to continue to lead a team to design, prototype, and assemble task-specific devices to help make everyday life easier.

Aside from 3D-printed prosthetics, she has gained experience in the neuroprosthetics field with her work in **Dr. Kevin Otto's NeuroProstheses Research Lab** within the J. Crayton Pruitt Family Department of Biomedical Engineering. The goal of a neuroprosthesis is to restore function in areas that have experienced neural damage. Over the last two years, Melissa has contributed to projects that test the effects of implantable micro-scale devices on causing perceptible stimulation in the somatosensory cortex. This work will have a significant impact on future solutions for those with spinal cord injuries and neurological disorders.

When asked about her motivation for choosing biomedical engineering, Melissa explains, **"I cannot imagine more fulfilling work than using my skills to continuously create and technologically advance devices that largely improve another person's quality of life. Throughout challenging curriculum and project iteration failures, reminding myself the "why" behind my work is what pushes me to strive for success. It has always been my goal to help others; and combined with my love for science, math, and engineering, biomedical engineering at the University of Florida has been a perfect fit."**

Jamal Lewis, Ph.D.
Associate Professor

(Starts Summer 2022)

BIOMATERIALS, DRUG DELIVERY, IMMUNOENGINEERING

Dr. Lewis' Immuno-modulatory Biomaterials Laboratory focuses on the development of biomaterial systems that can manipulate the immune system. The group plans to design the next generation of immunotherapeutics for applications in immune-related diseases. This multidisciplinary work incorporates aspects of biomaterials engineering, drug delivery and immunology.

Most recently, Lewis was an associate professor in the biomedical engineering department at UC Davis, joining the department in 2015. Before UC Davis, he was a Senior Scientist at OneVax, LLC, and a postdoc associate at UF BME.

AWARDS & HONORS

- UNIVERSITY OF FLORIDA 40 UNDER 40, 2021
- 1000 INSPIRING BLACK SCIENTISTS IN AMERICA (CELL PRESS), 2021
- BIOMATERIAL SCIENCE RSC EMERGING INVESTIGATORS, 2021
- SHU CHIEN EARLY CAREER LECTURER AWARD (FINALIST), 2020
- CELLULAR AND MOLECULAR BIOENGINEERING YOUNG INNOVATORS AWARD, 2020
- REGENERATIVE MEDICINE WORKSHOP, YOUNG FACULTY INVESTIGATOR AWARD, 2019
- NIGMS MAXIMIZING INVESTIGATOR RESEARCH AWARD, 2017

Ph.D., Biomedical Engineering, University of Florida, 2012

M.Sc., Biomedical Engineering, North Carolina State University, 2007

B.Sc., Chemical Engineering, Florida A&M University, 2004

PRIMARY FACULTY

NATIONAL FACULTY AWARDS:

Professional Societies w/ Fellows: 12

AIMBE Fellows: 10

NSF CAREER Awardees: 7

PECASE Awardees: 2

Kyle D. Allen
Associate Professor
Ph.D., Rice University

Novel strategies to diagnose and treat degenerative joint diseases

Wesley E. Bolch
Distinguished Professor & UF Term Professor
Ph.D., University of Florida

Dosimetry, computational medical physics and dose assessment

Mingzhou Ding
Distinguished Professor & J. Crayton Pruitt Family Professor
Ph.D., University of Maryland

Cognitive neuroscience, signal processing and neural imaging

Jon P. Dobson
J. Crayton Pruitt Family Professor
Ph.D., Swiss Federal Institute of Technology, ETH-Zurich

Magnetic micro- and nanoparticle-based biomedical applications

Ruogu Fang
Assistant Professor
Ph.D., Cornell University

Artificial intelligence, brain dynamics and medical image analysis

Meghan C. Ferrall-Fairbanks
Assistant Professor
Ph.D., Georgia Institute of Technology

Quantitative systems biology, mathematical modeling, cancer heterogeneity and evolutionary dynamics

Daniel Ferris
Robert W. Adenbaum Professor
Ph.D., University of California, Berkeley

Biomechanics, neuromechanical control, locomotion, mobile brain imaging, robotic exoskeletons and bionic prostheses

Eric Fuller
Instructional Assistant Professor
Ph.D., University of Florida

Engineering design and engineering education

Sarah Furtney
Instructional Assistant Professor & Undergraduate Coordinator
Ph.D., Clemson University

BME cellular engineering laboratory and engineering education research

Aysegul Gunduz
Associate Professor, UF Research Foundation Professor & UF Term Professor
Ph.D., University of Florida

Human brain mapping, neuromodulation and neural interfacing

Gregory A. Hudalla
Associate Professor
Ph.D., University of Wisconsin

Molecular engineering for immunotherapies and immune modulation

Benjamin G. Keselowsky
Professor & Associate Chair for Graduate Studies
Ph.D., Georgia Institute of Technology

Biomaterials and controlled release systems for vaccines, immunotherapies and implants

Jamal Lewis (Summer 2022)
Associate Professor
Ph.D., University of Florida

Biomaterials, drug delivery, and immunoengineering

May Mansy
Instructional Assistant Professor
Ph.D., University of Florida

Bio-signals & systems, bio instrumentation lab and engineering education

Peter S. McFetridge
Associate Professor & Graduate Coordinator
Ph.D., University of Bath

Naturally inspired biomaterials for biologically functional implants and organ regeneration

Walter Lee Murfee
Associate Professor & Associate Chair for Undergraduate Studies
Ph.D., University of Virginia

Cell dynamics, microcirculation, angiogenesis, lymphangiogenesis and neurogenesis

Jennifer A. Nichols
Assistant Professor
Ph.D., Northwestern University

Biomechanics, musculoskeletal modeling, predictive simulation, medical imaging and machine learning

Kevin J. Otto
Professor & Senior Associate Chair
Ph.D., Arizona State University

Neural engineering, device-tissue interfaces and neurostimulation

Ivana Parker
Assistant Professor
Ph.D., Georgia Institute of Technology

Trained immunity, systems biology, HIV/TB, host-pathogen interactions and applied proteomics

Edward A. Phelps
Assistant Professor & J. Crayton Pruitt Family Term Fellow
Ph.D., Georgia Institute of Technology

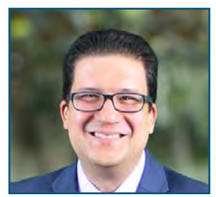
Cell and tissue regeneration, islet biology, diabetes and immunoengineering

Ana Maria Porras
Assistant Professor
Ph.D., University of Wisconsin-Madison

Biomaterials & tissue engineering to study host-microbe interactions and inclusive science communication

Parisa Rashidi
Associate Professor & J. Crayton Pruitt Family Term Fellow
Ph.D., Washington State University

Medical artificial intelligence (AI) and pervasive health



Carlos Rinaldi-Ramos
Dean's Leadership Professor & Chemical Engineering Depart. Chair
Ph.D., Mass. Institute of Technology

Nanomedicine and magnetic nanoparticles

Christine E. Schmidt
Professor, J. Crayton Pruitt Family Chair & Department Chair
Ph.D., University of Illinois

Biomaterials for neural tissue regeneration and neural interfacing

Blanka Sharma
Associate Professor & J. Crayton Pruitt Family Term Fellow
Ph.D., Johns Hopkins University

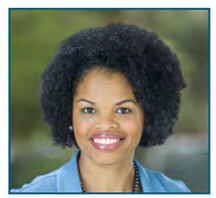
Nanomedicine, biomaterials, targeted drug/gene delivery and immunoengineering

Cherie Stabler
Professor & Integra LifeSciences Term Professor
Ph.D., Georgia Institute of Technology

Biomaterials, controlled release, regenerative medicine and diabetes

Brittany Taylor
Assistant Professor
Ph.D., Rutgers University

Musculoskeletal tissue engineering, bioactive biomaterials, tendon injury and repair



Lakiesha N. Williams
Associate Professor
Ph.D., Mississippi State University

Traumatic brain injury, soft tissue mechanics, bio-inspired design and materials characterization

Herbert Wertheim College of Engineering
J. Crayton Pruitt Family Department of
Biomedical Engineering at the University of Florida
Biomedical Sciences Building JG56
1275 Center Drive, P.O. Box 116131
Gainesville, FL 32611-6131

ENGINEERS *for* LIFE.

U.S. NEWS & WORLD REPORT RANKS UNIVERSITY OF FLORIDA FIFTH AMONG TOP PUBLIC UNIVERSITIES IN ITS 2022 BEST COLLEGES RANKINGS

THE ANNOUNCEMENT CEMENTS UF'S METEORIC RISE IN RANKINGS OVER THE PAST FIVE YEARS AND PUBLICLY RECOGNIZES THE UNIVERSITY'S EXCELLENCE AND VALUE.