



# Engineering & Computing

Department of Biomedical Engineering

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## 2022 FACULTY OVERVIEW

# BIOMEDICAL ENGINEERING AT FIU

- Established in 2003 with a \$10 million endowment from the Wallace H. Coulter Foundation and the State of Florida.



- The first Biomedical Engineering department in Florida with a full slate of programs (accredited BS, MS, BS/MS and Ph.D.)
- The only one in the nation offering these degrees at a Hispanic and Minority serving institute





# BME STUDENT OPPORTUNITIES

- Coulter Seminar Series
- Graduate Research Day
- Coulter Graduate Fellowships
- Senior Design Expo and Competition
  - **Projects 100% sponsored by industry or clinical sponsors**
- Undergraduate Research Day
- Undergraduate Research Fellowships
  - **Coulter Undergraduate Research Excellence Program Norman Weldon Undergraduate Students Summer Research Internship**
- Travel Awards
- Clinical Rotations







# BME STUDENT SOCIETIES

- **BMES**

- Biomedical Engineering Society

- **AEMB**

- Alpha Eta Mu Beta Engineering Honor Society

- **IEEE-EMBS**

- Institute of Electrical and Electronics Engineers Engineering in Medicine and Biology Society

- **Panther Bionics**

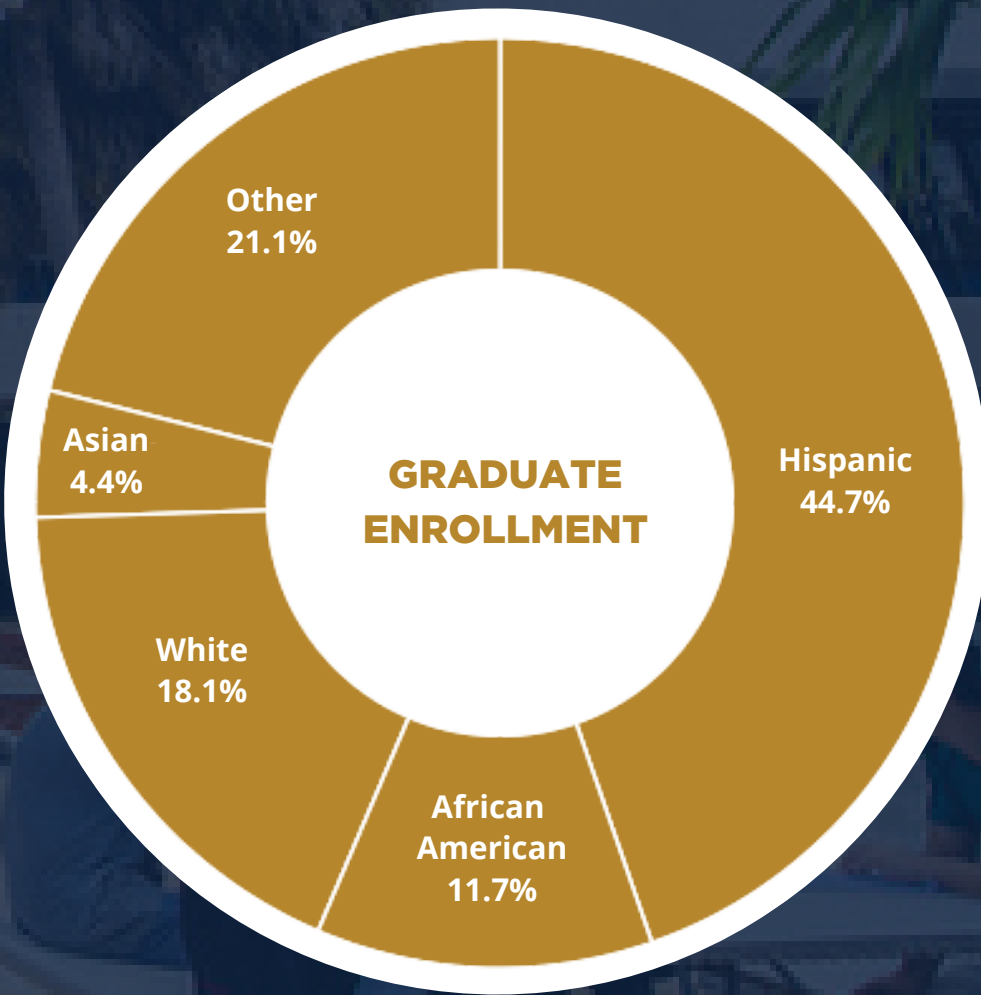
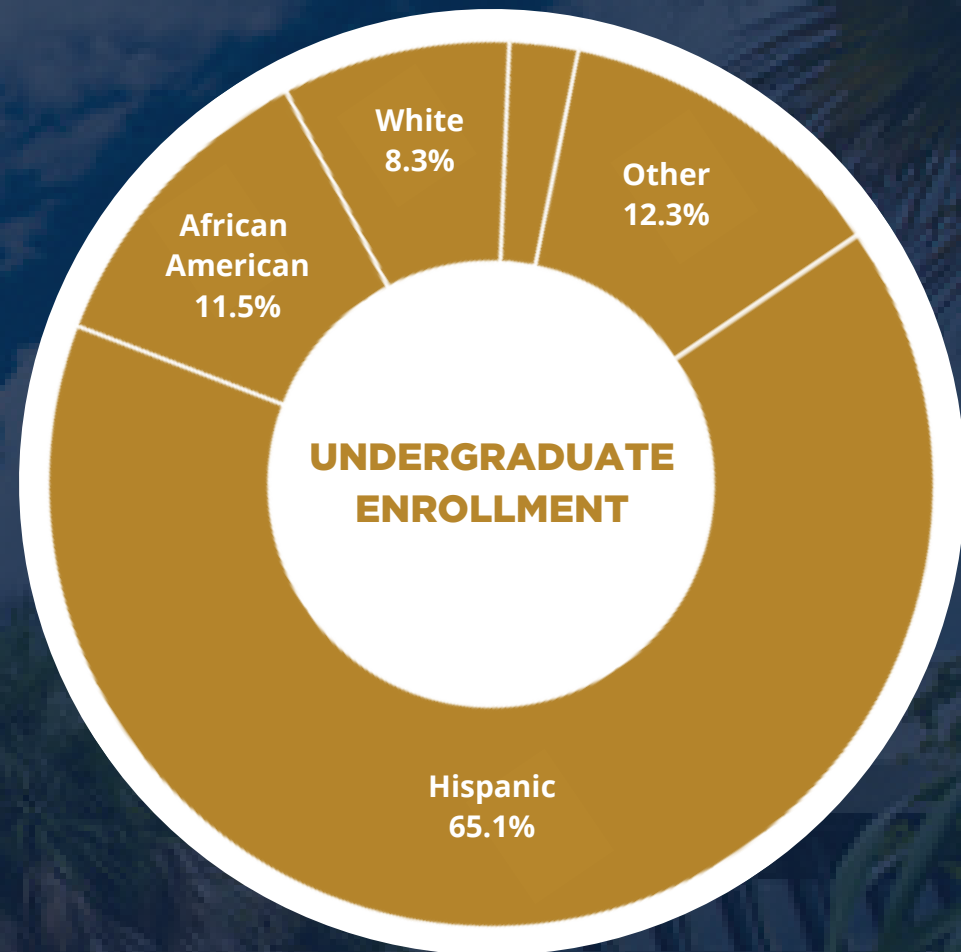
- Panther Bionics is a student driven organization created at FIU which aims to inspire, educate and empower students by tackling biomedical engineering project through creativity, innovation and vision.



# BME STUDENT DEMOGRAPHICS

Out of 358 colleges and universities

- **#1** BME bachelor's degrees awarded to Hispanic students
- **#2** In Master's degrees awarded to Underrepresented Minorities by total
- **#11** BME bachelor's degrees awarded to African American students
- **500+** Alumni
- **AEMB** (Honor Society) voted 2017 Most Active National Chapter



**TOP 50**  
Top 50 World University Ranking  
in Engineering

**#41**  
among best graduate biomedical  
engineering programs



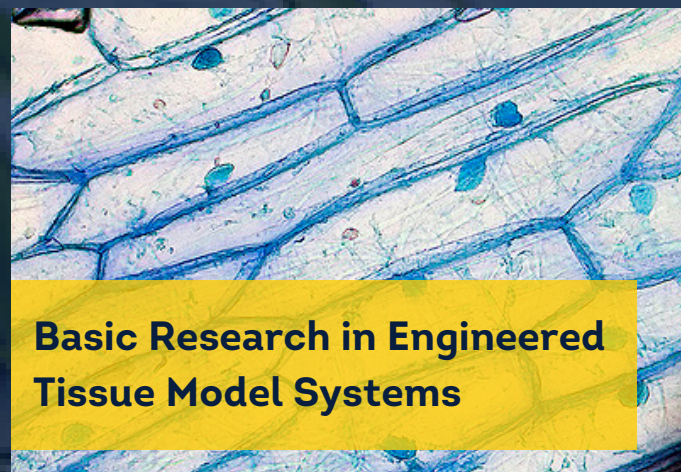
# RESEARCH IN BME

*Pathway to Success*

**DISCOVER • DESIGN • DEVELOP • DELIVER**



# RESEARCH IN BIOMEDICAL ENGINEERING



**Basic Research in Engineered  
Tissue Model Systems**

Focused on cell and engineered tissue mechanics with a particular focus on cardiovascular regenerative medicine. Research in this area includes development of non-invasive strategies to restore normal tissue function and design and synthesis of living tissue replacements.



**Diagnostic Bioimaging and  
Sensor Systems**

Research includes developing non-invasive and invasive imaging and sensor technologies that can detect disease development and tissue pathologies *in vivo*, with a focus on photonics.

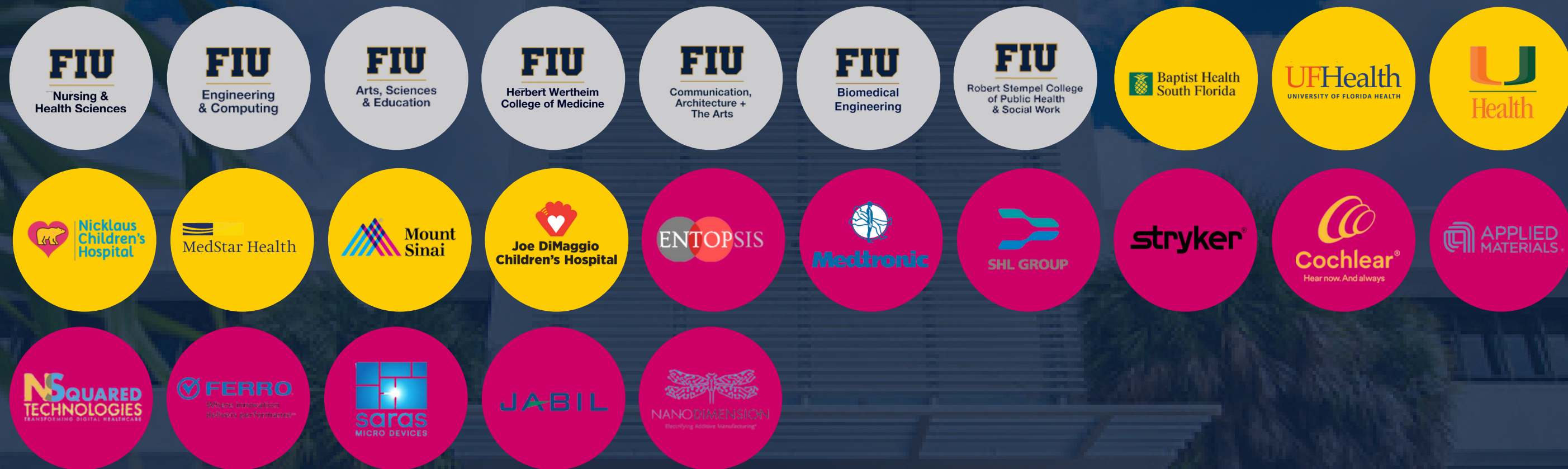


**Therapeutic and Reparative  
Neurotechnology**

Focused on fundamental neuroscience and neural interfaces to repair and promote recovery of lost function after trauma or disease.



# RESEARCH COLLABORATION



## FUNDING AGENCIES (SELECT)





# RESEARCH ACCOMPLISHMENTS

60+ Patents

2 Startup Companies since 2014

2 i-Corps teams

2 Engineering Research Centers

6 Fellows

## FELLOWS



## SENIOR MEMBERS



**Zachary Danziger, Ph.D.** is making strides in understanding bladder control and brain-computer interface technology.



**Anuradha Godavarty, Ph.D.** Is developing low-cost hand-held optical devices for wound healing center imaging assessment and conducting clinical studies.



**Joshua Hutcheson, Ph.D.** studies cardiovascular disease mechanisms, treatments, and diagnosis.



**Shuliang Jiao, Ph.D.** works on biophotonic devices that help treat retinal degenerative disorders.



**Wei-Chiang Lin, Ph.D.** develops sensing and imaging technologies for diagnosis.



**Anthony McGoron, Ph.D.** develops targeted image-guided drug-delivery for combating cancer.



**Anamika Prasad, MD, Ph.D.** studies structure and mechanics of bone and cardiovascular tissue and computational analysis of biomedical system and devices



**Raj Pulugurtha, Ph.D.** develops packaging of bioelectronic implants for health monitoring and advanced electronic therapeutics.



**Sharan Ramaswamy, Ph.D.** advances biomechanically-derived diagnostics and regenerative therapies for cardiovascular medicine.



**Jessica Ramella-Roman, Ph.D.** her biophotonic device is in clinical trial for pre-mature labor and cervical cancer.



**Jorge Riera-Diaz, Ph.D.** is making strides in treating multiple brain disorders using new imaging techniques.



**James Schummers, Ph.D.** is working to unravel the brain circuits underlying vision.



**Oleskii Shandra, Ph.D.** studies neuroscience with a focus on the development of seizures



**Nikolaos Tsoukias, Ph.D.** studies neurovascular coupling..



# EDUCATING TOMORROW'S ENGINEERS

Engineering for the Benefit of Humanity

**EXCITING • CREATIVE • ADVENTUROUS • RIGOROUS**  
**DEMANDING • EMPOWERING**



# BIOMEDICAL ENGINEERING FACULTY



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## ADJUNCT FACULTY



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**Leonel E. Lagos, Ph.D.**  
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**Ilmar Tamames**  
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**Michael Brown, MD, Ph.D.**  
Teaching Professor  
**brownm@fiu.edu**  
**305.348.1213 | EC 2676**

Academic Expertise: Systems biology, tissue engineering and drug delivery

## Research Interests

- Undergraduate medical education and preparation for medical school: Experience from eleven years serving on the FIU College of Medicine College of Medicine Admissions Committee. Multiple teaching awards received from both FIU and The College of Engineering in the last eighteen years.
- Diagnosis and treatment of cardiovascular disease including atherosclerosis and valvular heart disease. Participation in clinical trials involving diabetes and abdominal aortic aneurisms
- Regenerative medicine: Experience in industry with cell therapy clinical trials for myocardial regeneration
- Molecular biology and its application in diagnosis and treatment of disease.





**Michael Christie, Ph.D.**

Associate Teaching Professor &  
Faculty Fellow of the Honors College

**mchristi@fiu.edu**

**305.348.7392 | EC 2690**

Academic Expertise: Biomechanics, Biomaterials, Medical Device product development, design, and manufacturing. Computational modeling of cardiovascular and related diseases for improved device design and clinical intervention strategies

## **Ongoing Research**

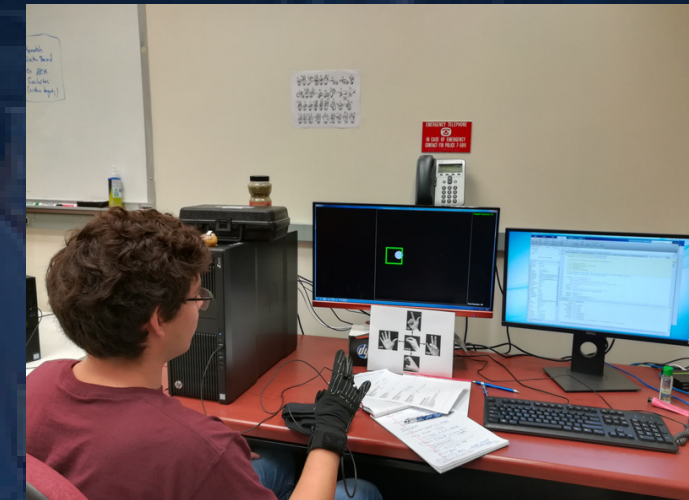
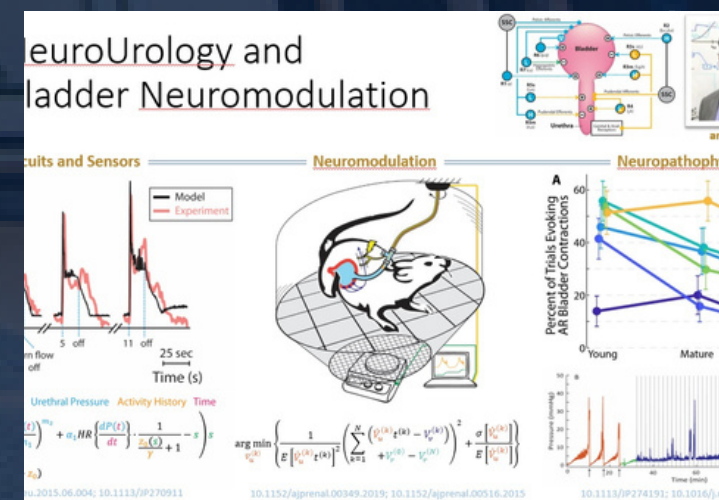
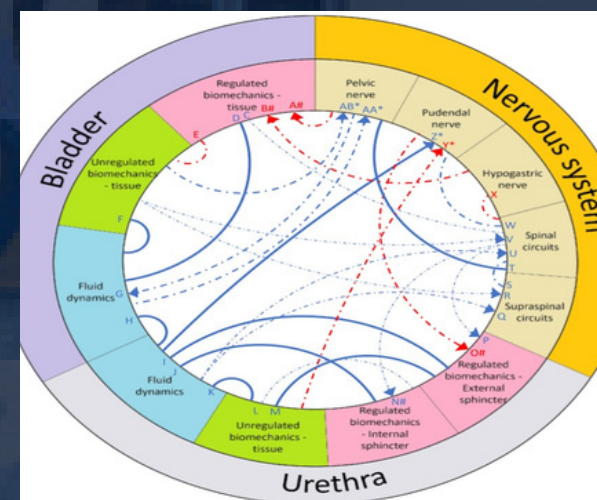
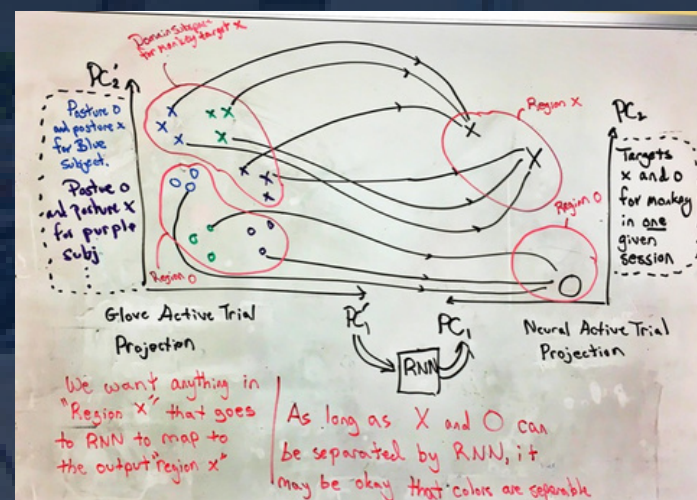
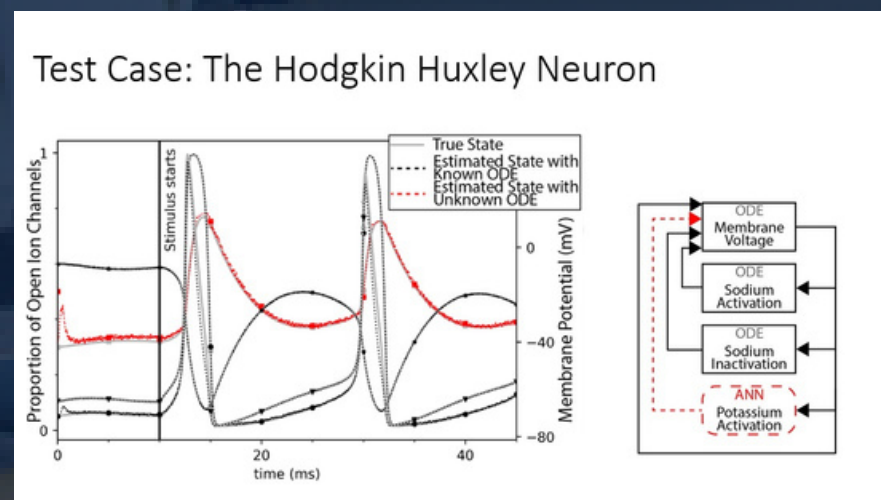
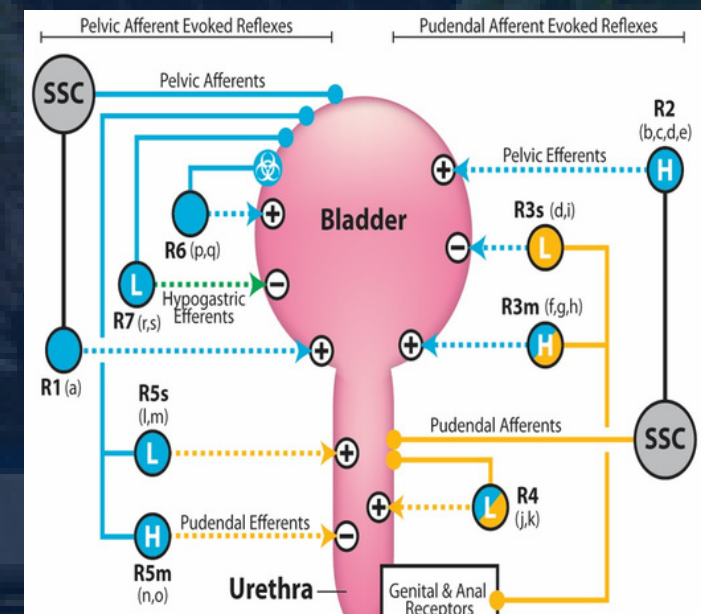
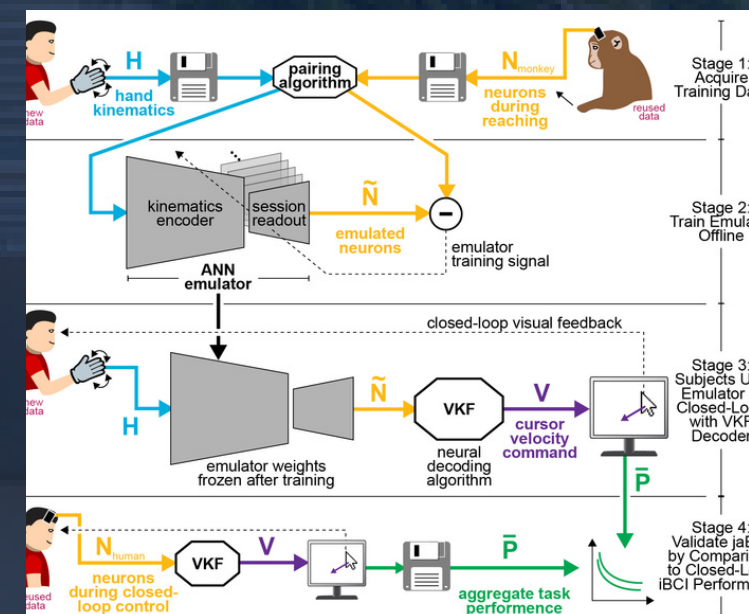
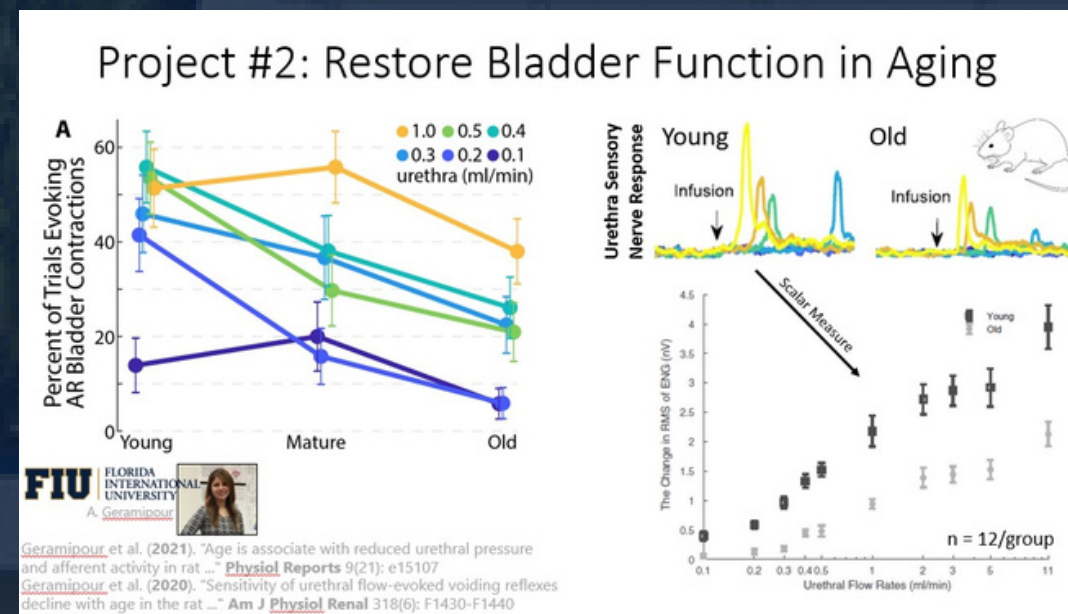
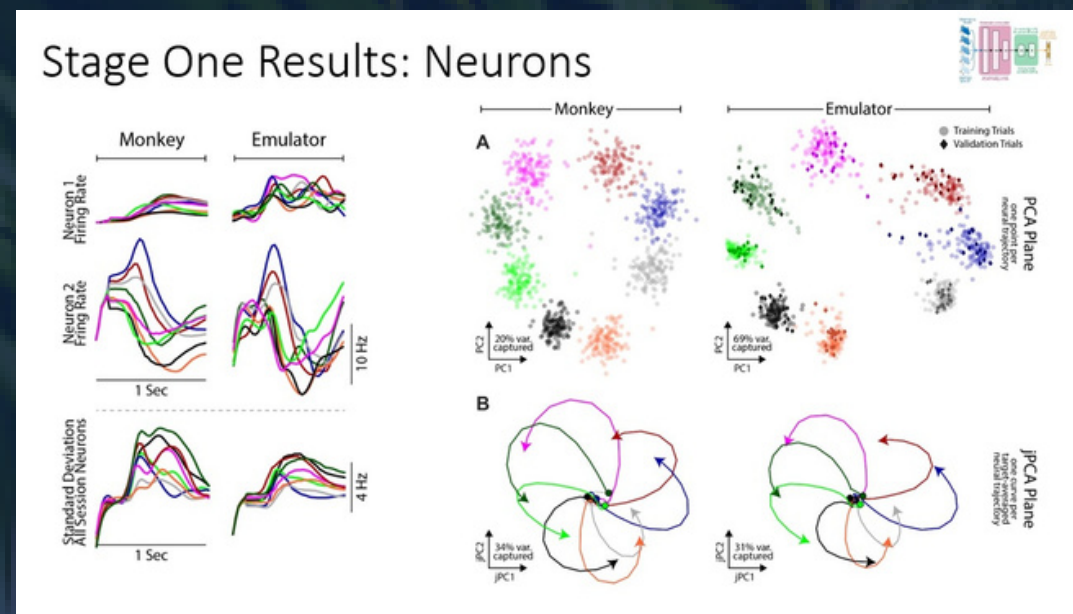
- Computational Modeling of blood flow in diabetics and hypertensives and the implications on disease progression and treatment.
- Effects of Static Magnetic fields on the differentiation and proliferation of bone cells
- Ethical applications of biochemical compounds for national welfare and security.





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**305.348.0187 | EC 2677**

Research Interests: Neural Engineering, Brain-Computer interfaces, Neurology

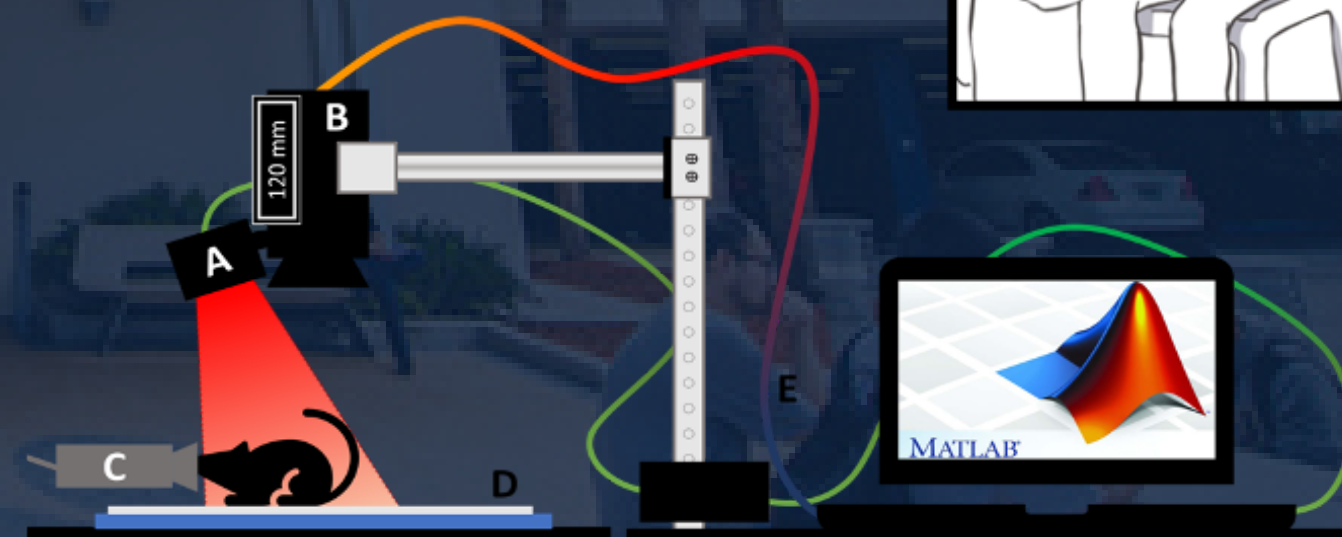
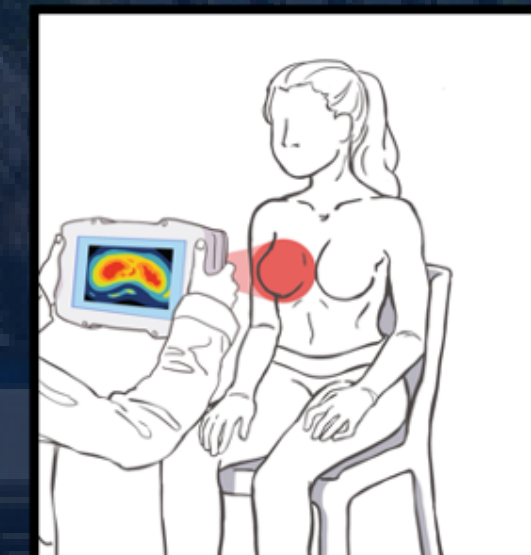
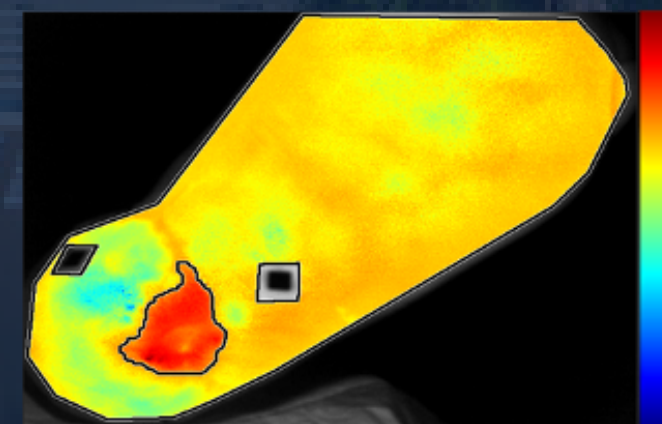






**Anuradha Godavarty, Ph.D.**  
Associate Professor &  
Undergraduate Program Director  
**godavart@fiu.edu**  
**305.348.7340 | EC 2675**

Research Interests: Optical-based molecular imaging (fluorescence-enhancing optical imaging) and tomography

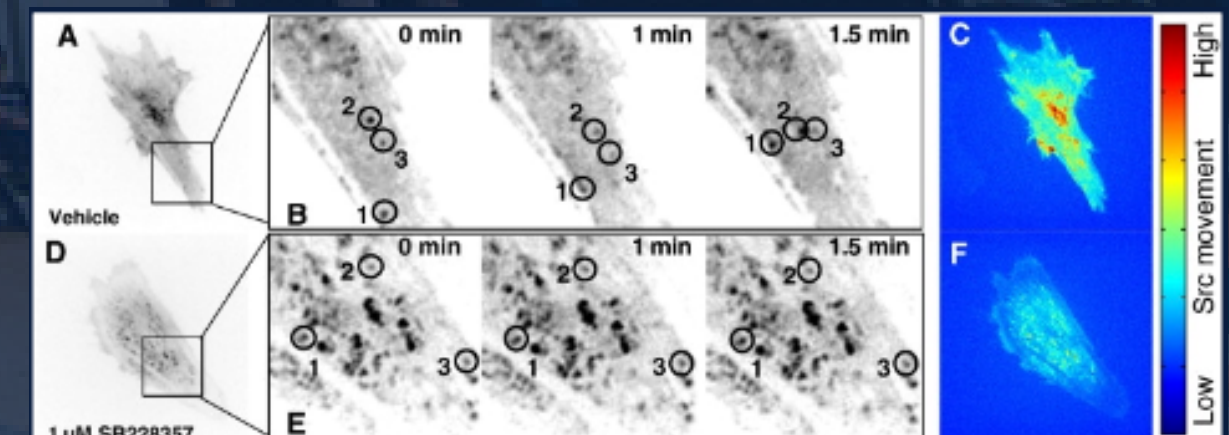
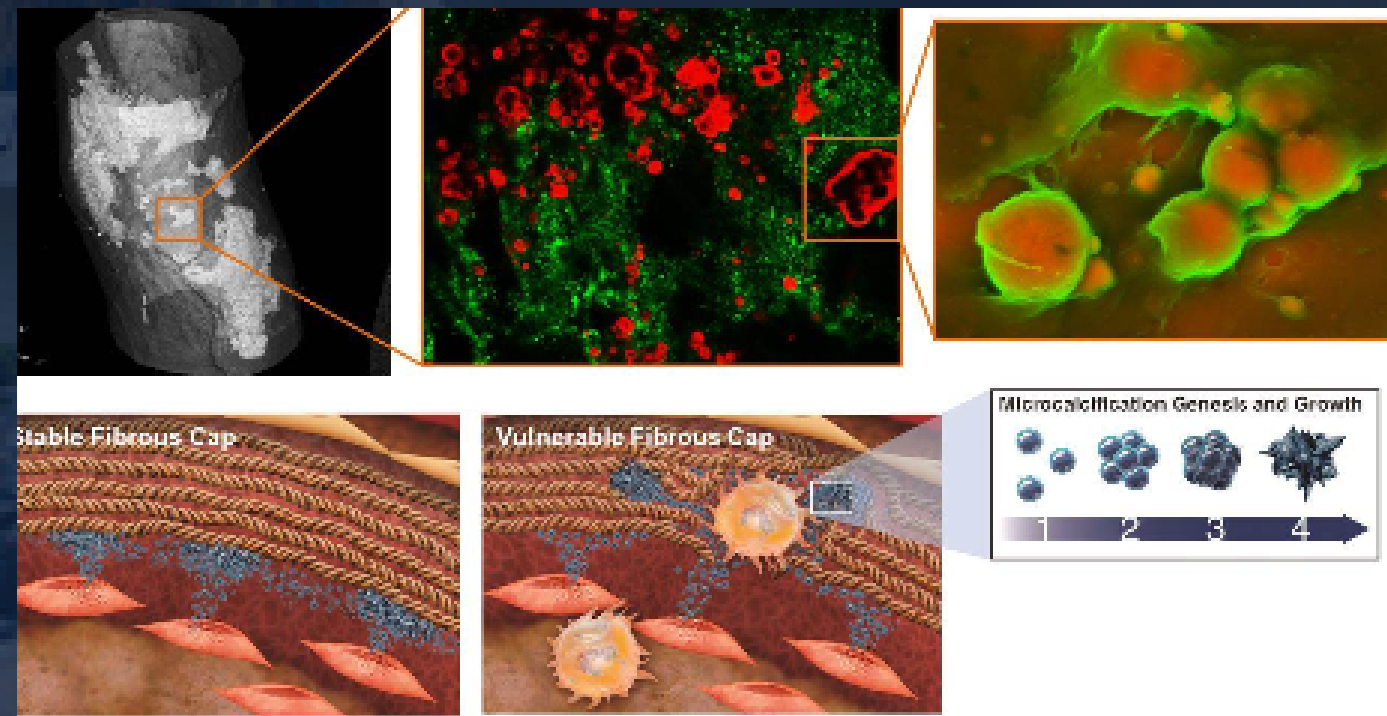
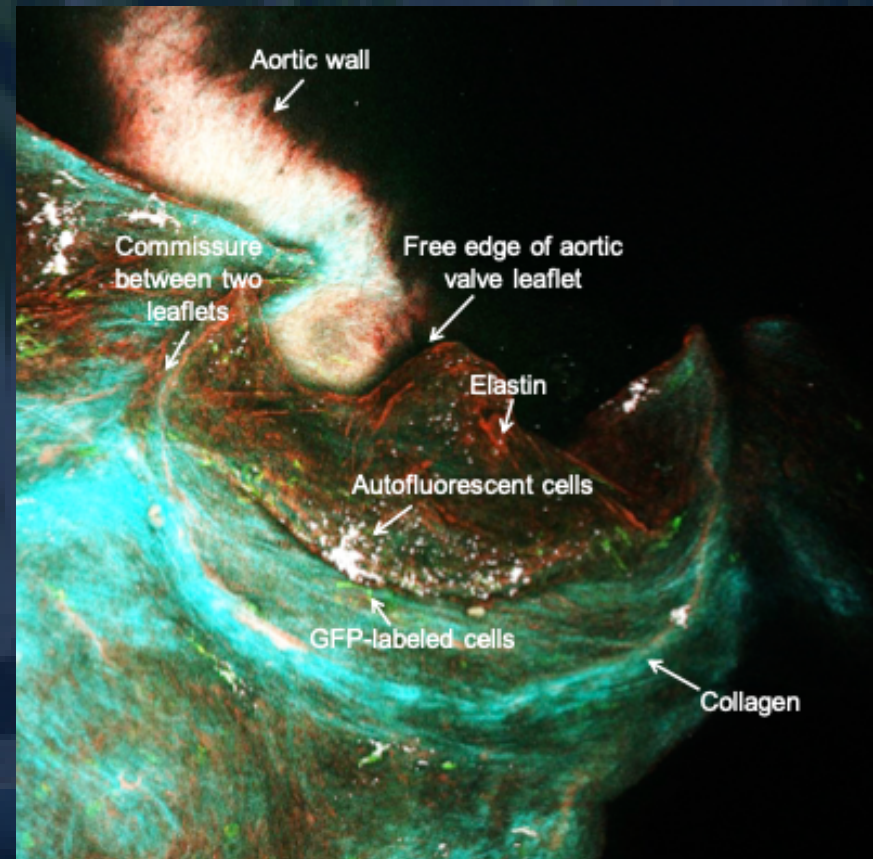






**Joshua Hutcheson, Ph.D.**  
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**305.348.0157 | EC 2612**

Research Interests: Cardiovascular disease and mechanobiology, Cell-cell and cell-matrix interactions, Tissue engineering, molecular imaging



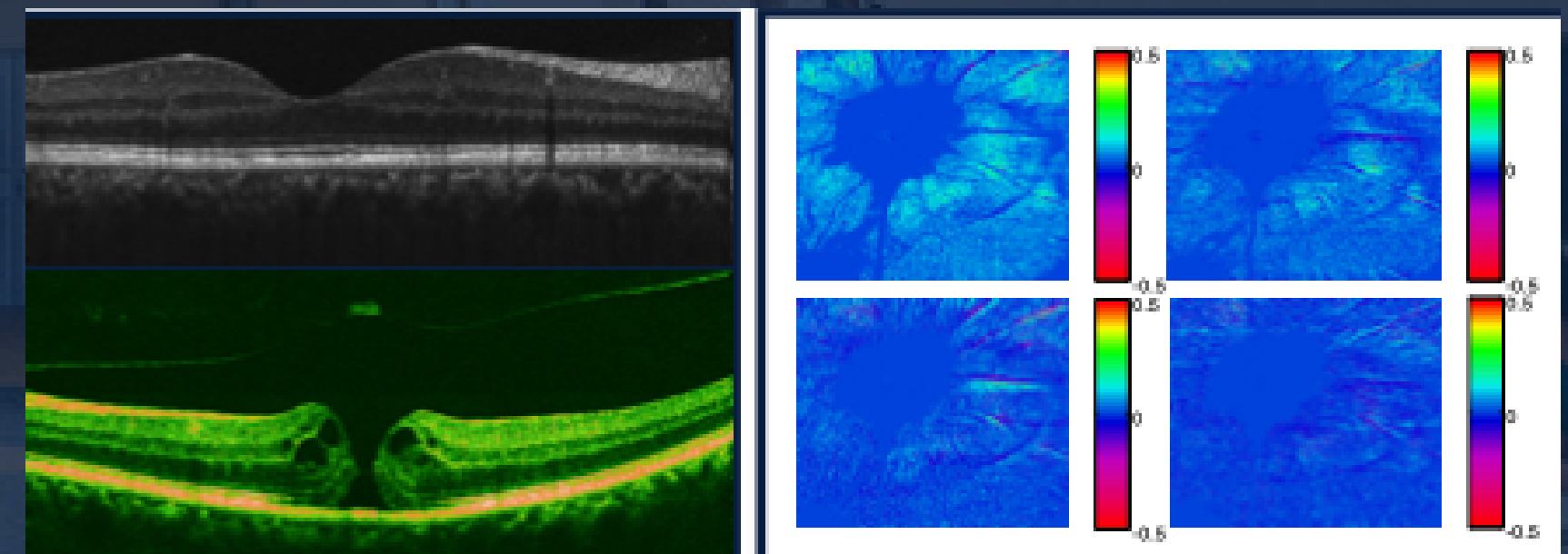
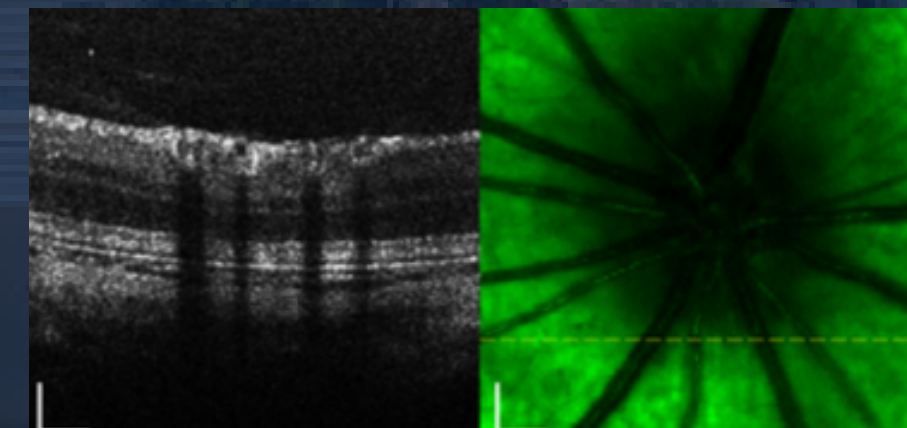
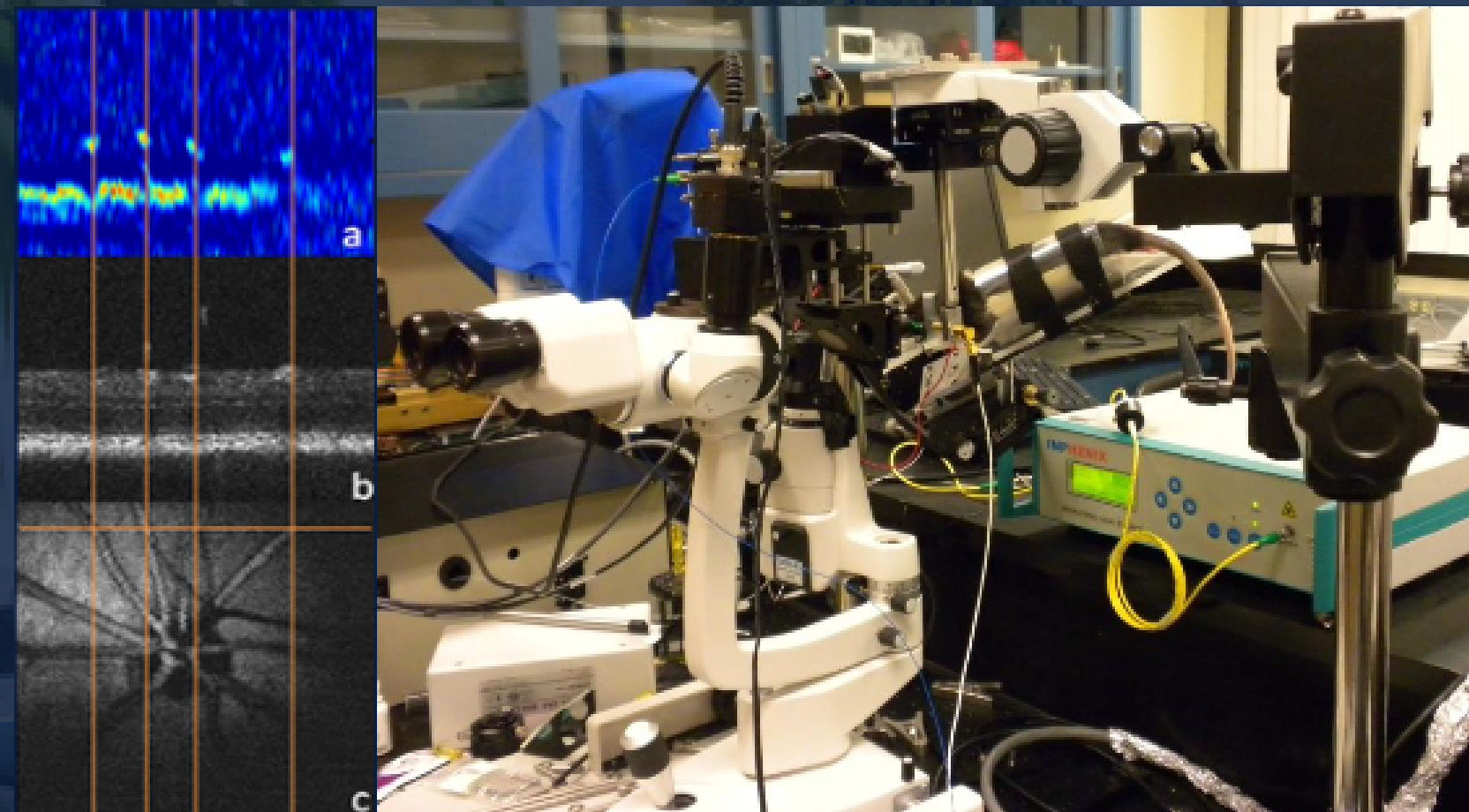




**Shuliang Jiao, Ph.D.**  
Associate Professor  
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**305.348.4984 | AHC4 Rm 332**

Research Interests: Optical Coherence Tomography, Photoacoustic Microscopy, Multimodal Imaging





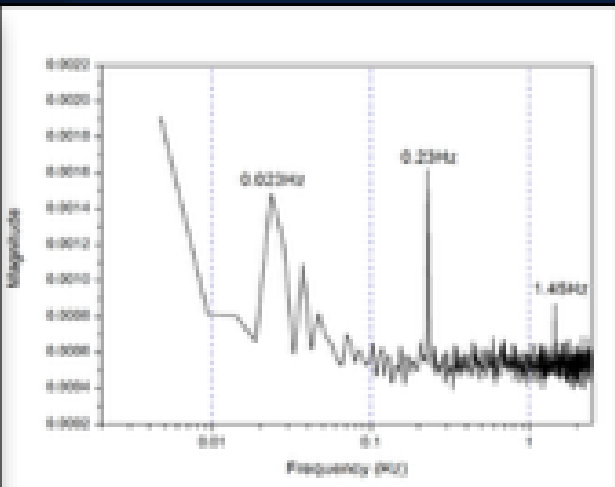
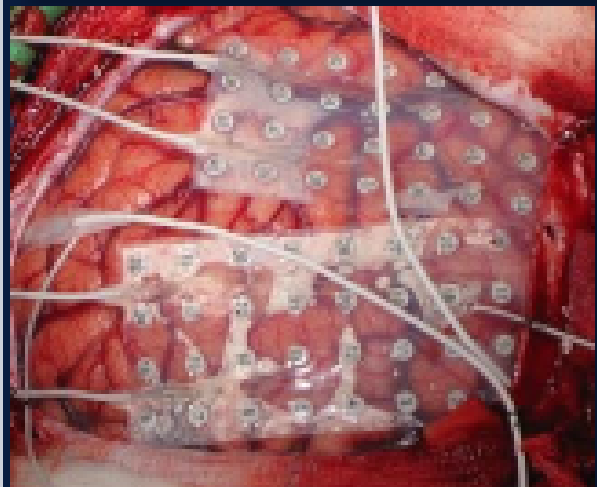
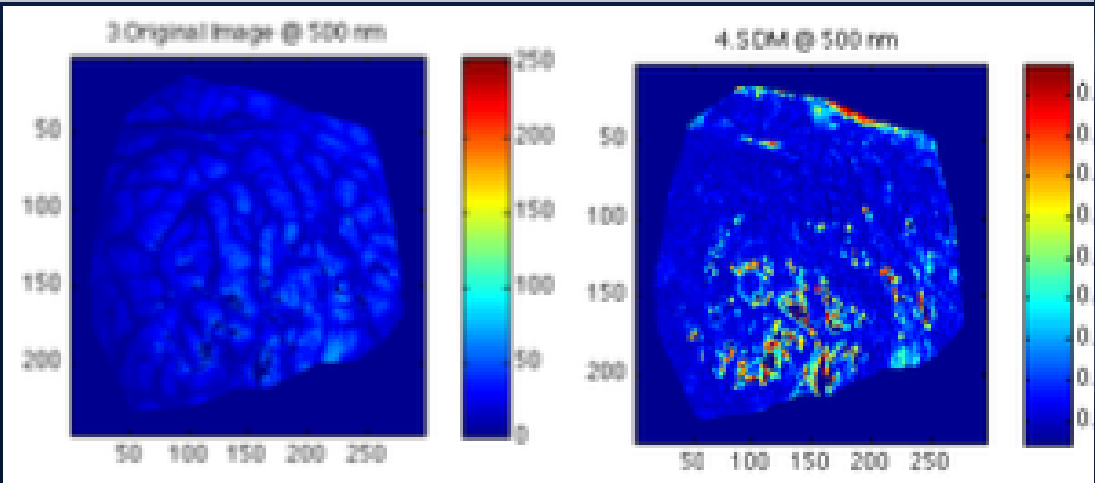
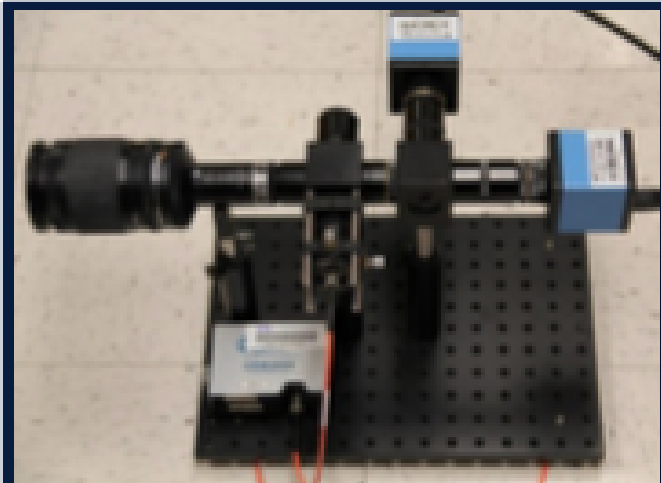
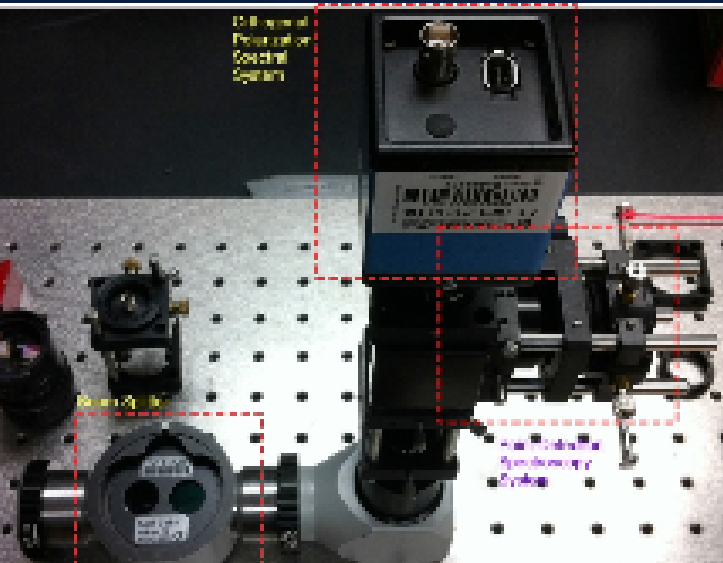
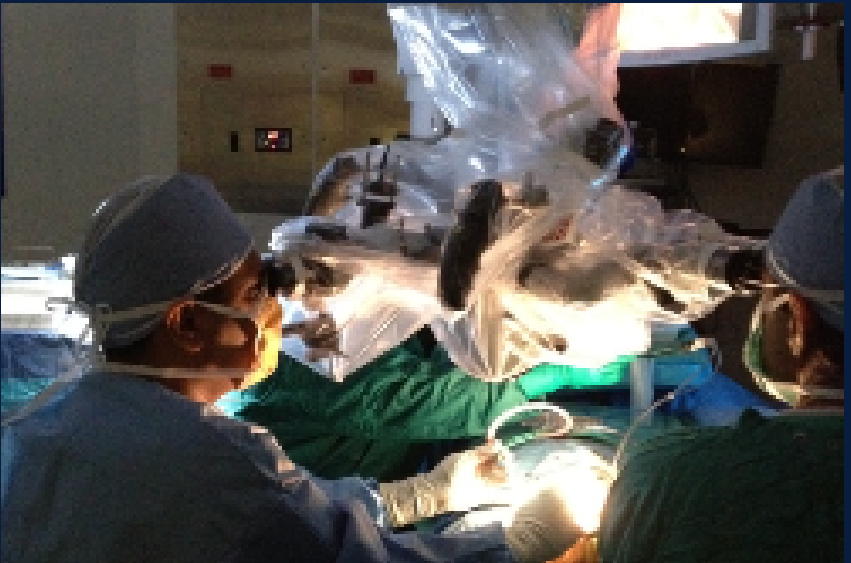
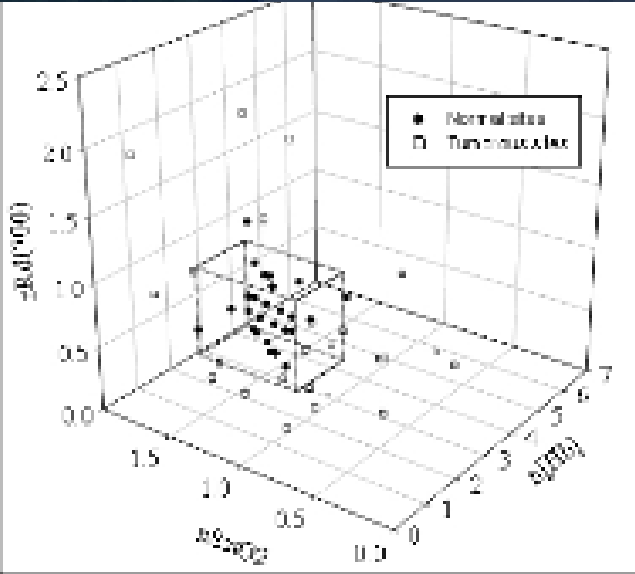
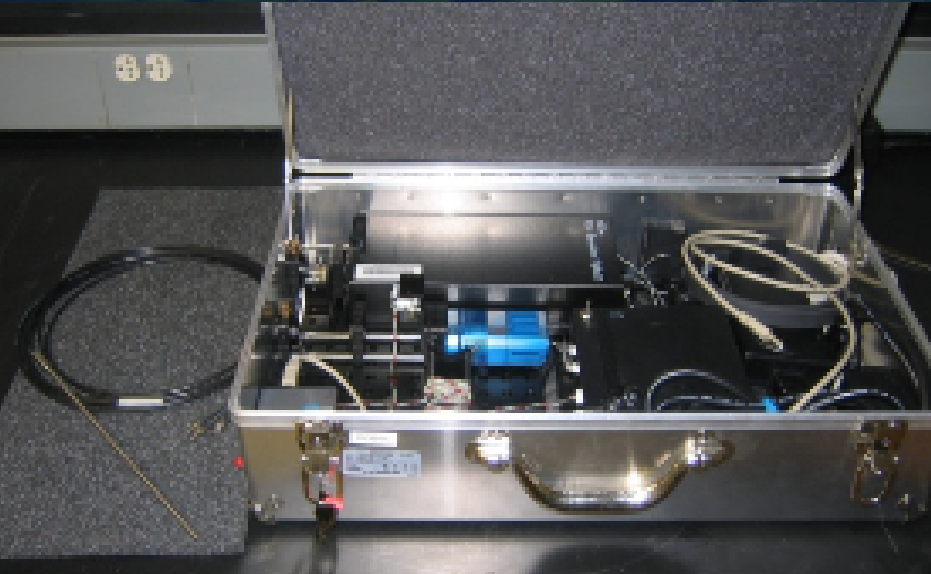
**Wei-Chiang Lin, Ph.D.**

Associate Professor

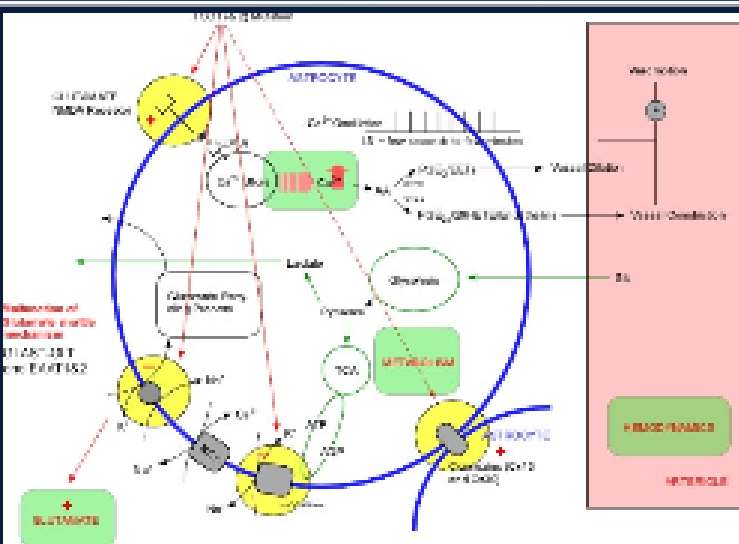
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Research Interests: Biophotonics, Ultrasound, and Medical Instrumentation



| Signal                   | Agent                 |
|--------------------------|-----------------------|
| Glutamate                | FRET                  |
| Ca <sup>2+</sup> Signals | Rhod_2                |
| Electrical Activities    | Voltage Sensitive Dye |
| Metabolism               | NADH or FAD           |
| Hemodynamics             | Hb                    |



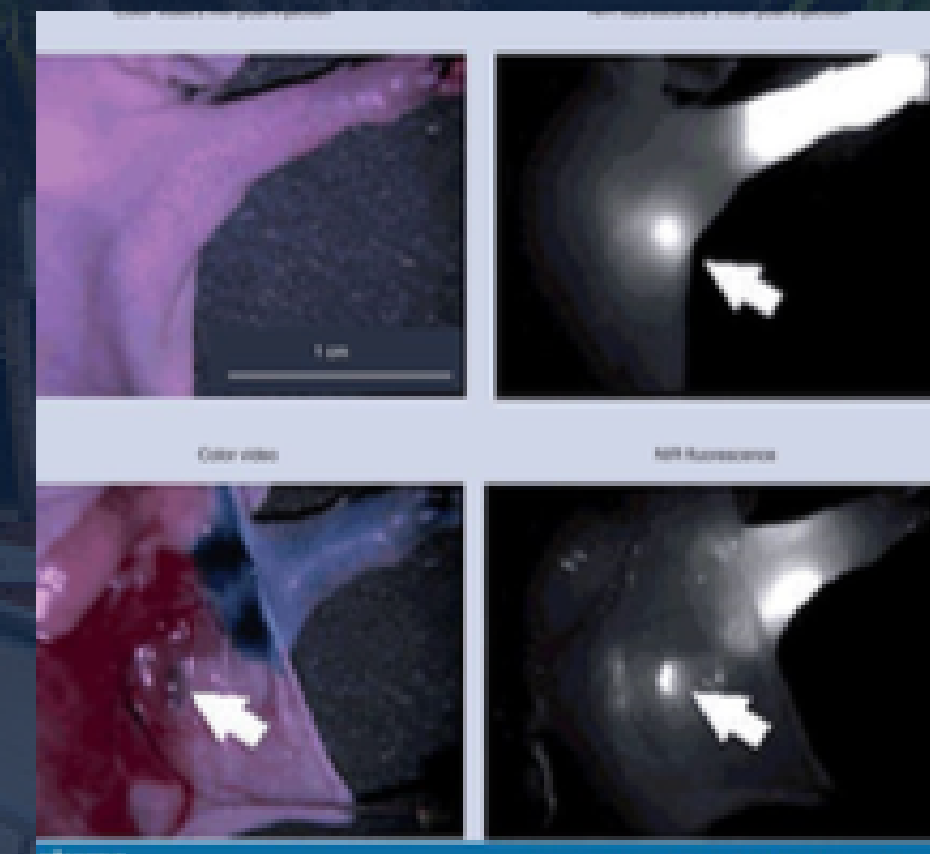
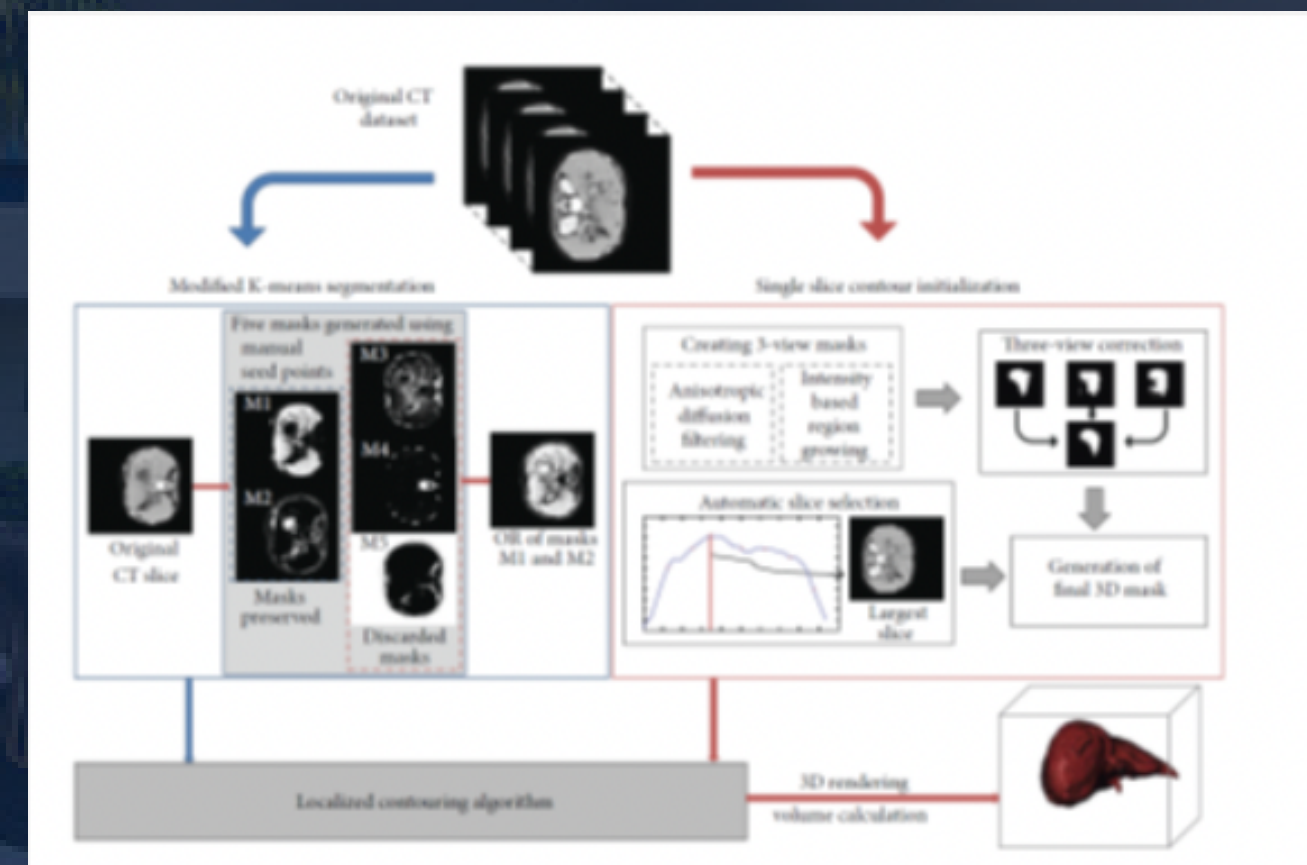




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The diagram illustrates the design of a nanomedicine for cancer treatment and diagnosis. It shows a cross-section of a tumor with a central necrotic core. A legend identifies the components: Nanoparticle (blue circle), Chemotherapy Agent (DOX) (red dots), Imaging Agent (ICG) (green dots), Antibody fragment (yellow Y-shape), Tagging moiety (purple Y-shape), and Stealth coating (PEG) (orange line). The diagram shows the nanoparticle entering the tumor, releasing the chemotherapy agent, and the imaging agent for diagnosis.

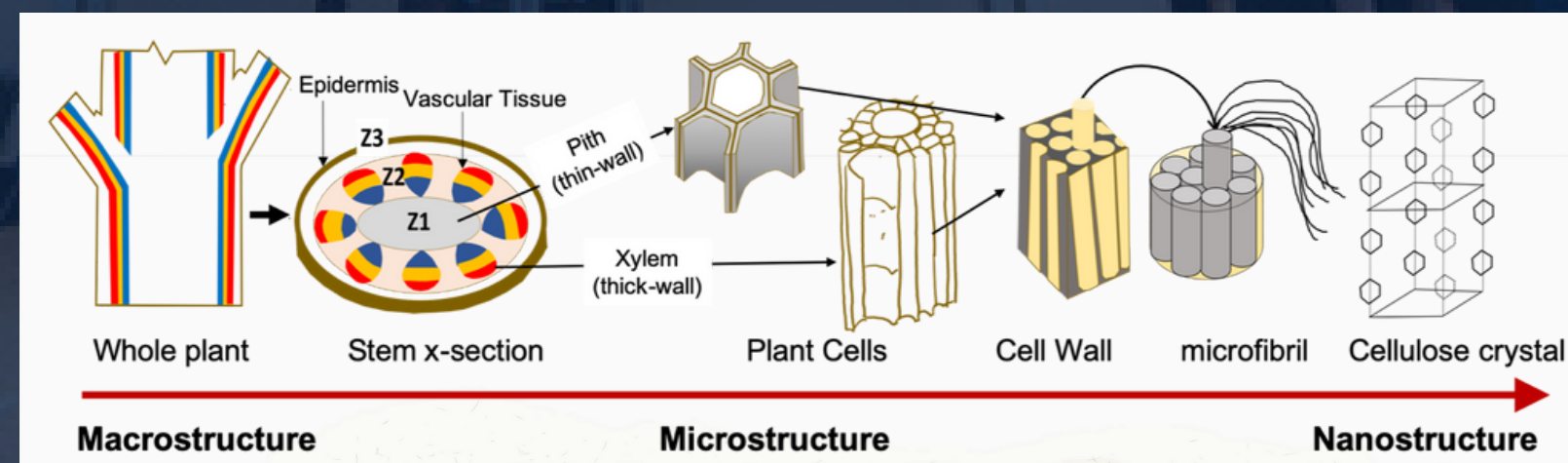
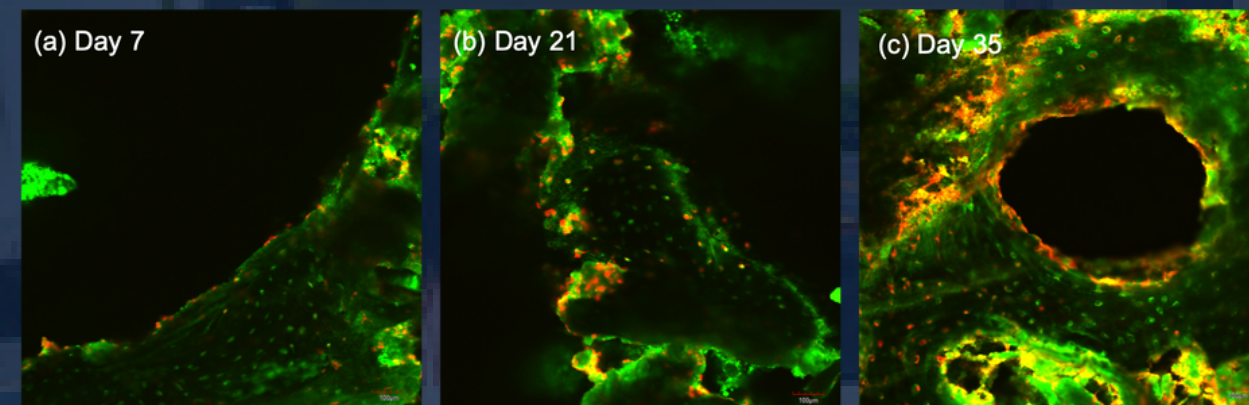
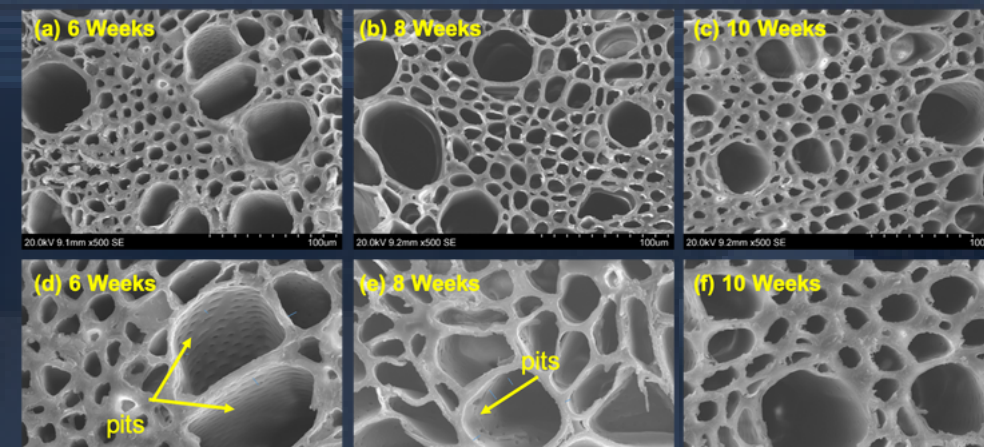
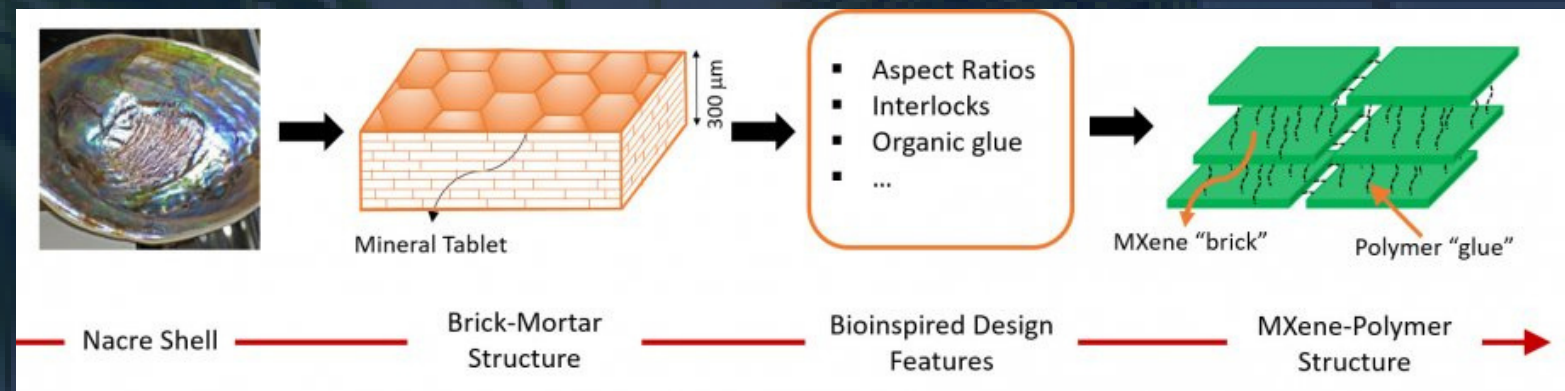






**Anamika Prasad, MD, Ph.D.**  
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Research Interests: Biobased and bioinspired material design, Tissue biomechanics (bone tumor, vascular tissue in plant, cardiovascular tissue), Nano-mechanical characterization Biomedical devices for precision agriculture and healthcare

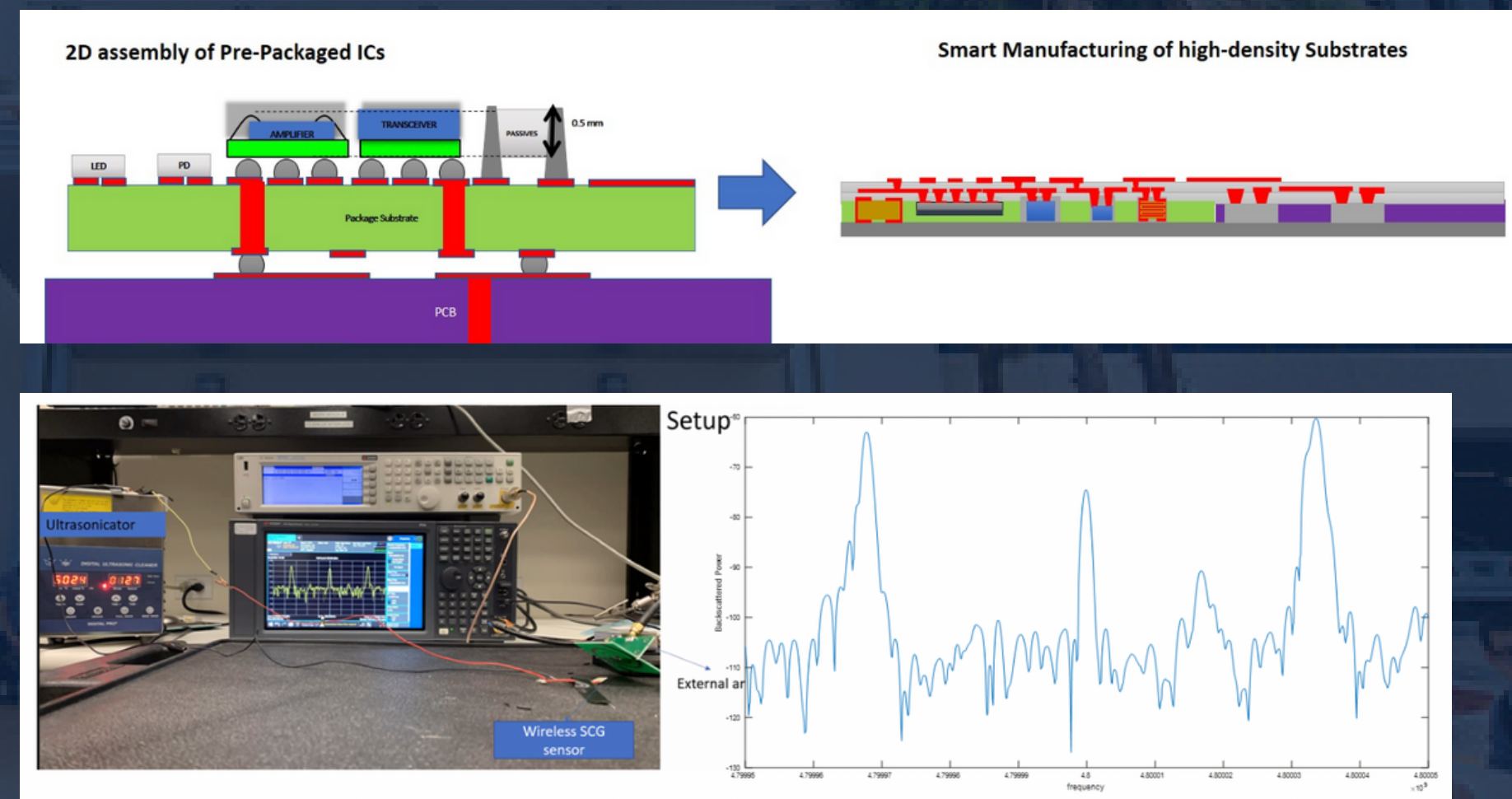
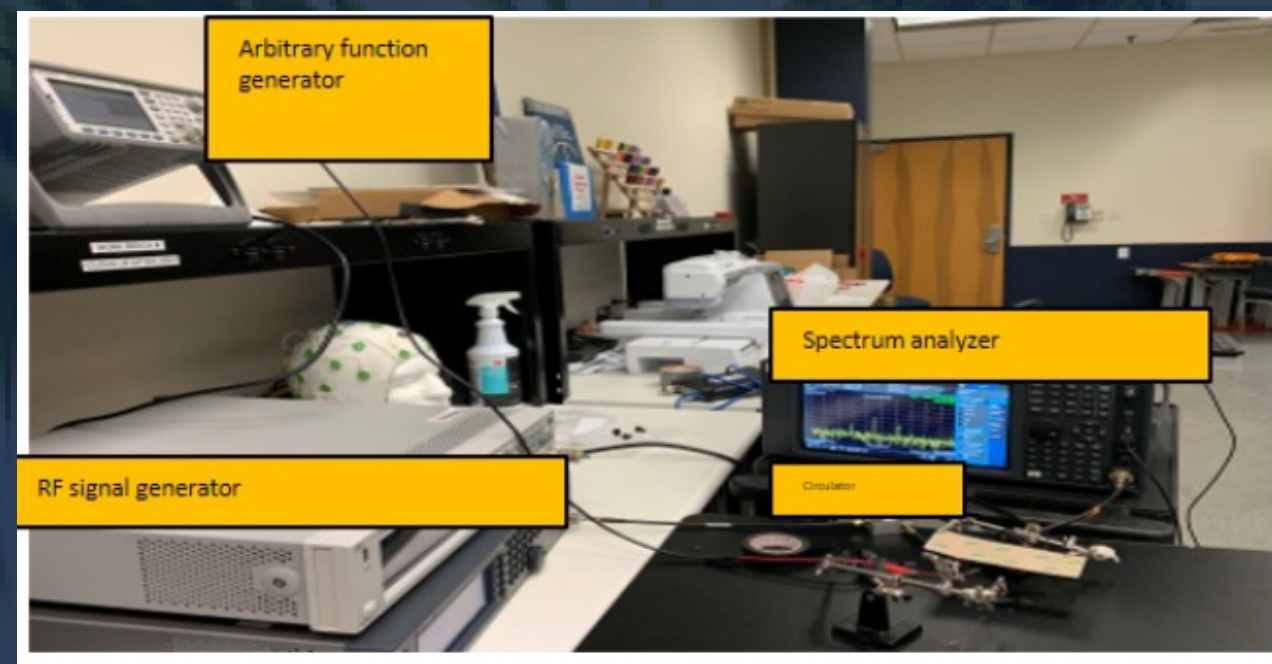






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Research Interests: Therapeutic and Reparative Neurotechnology

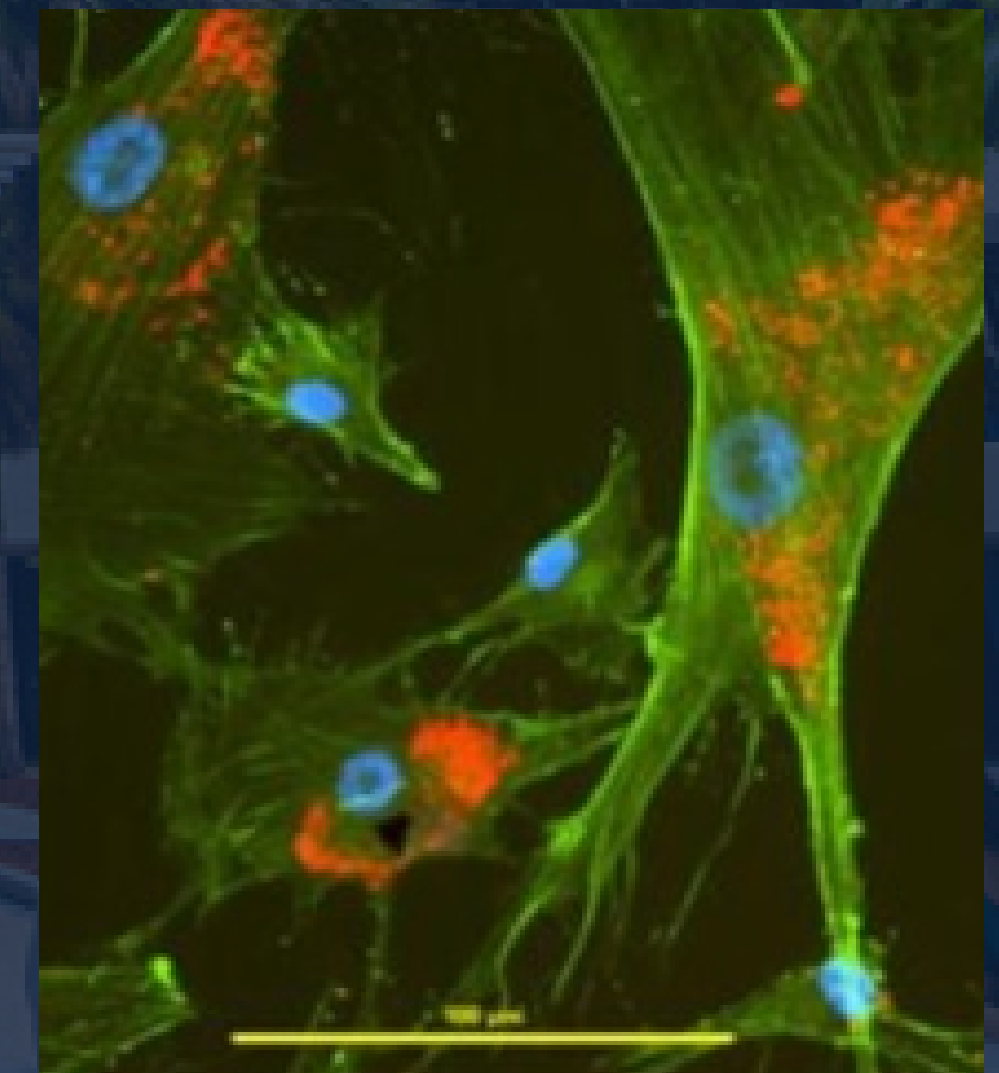
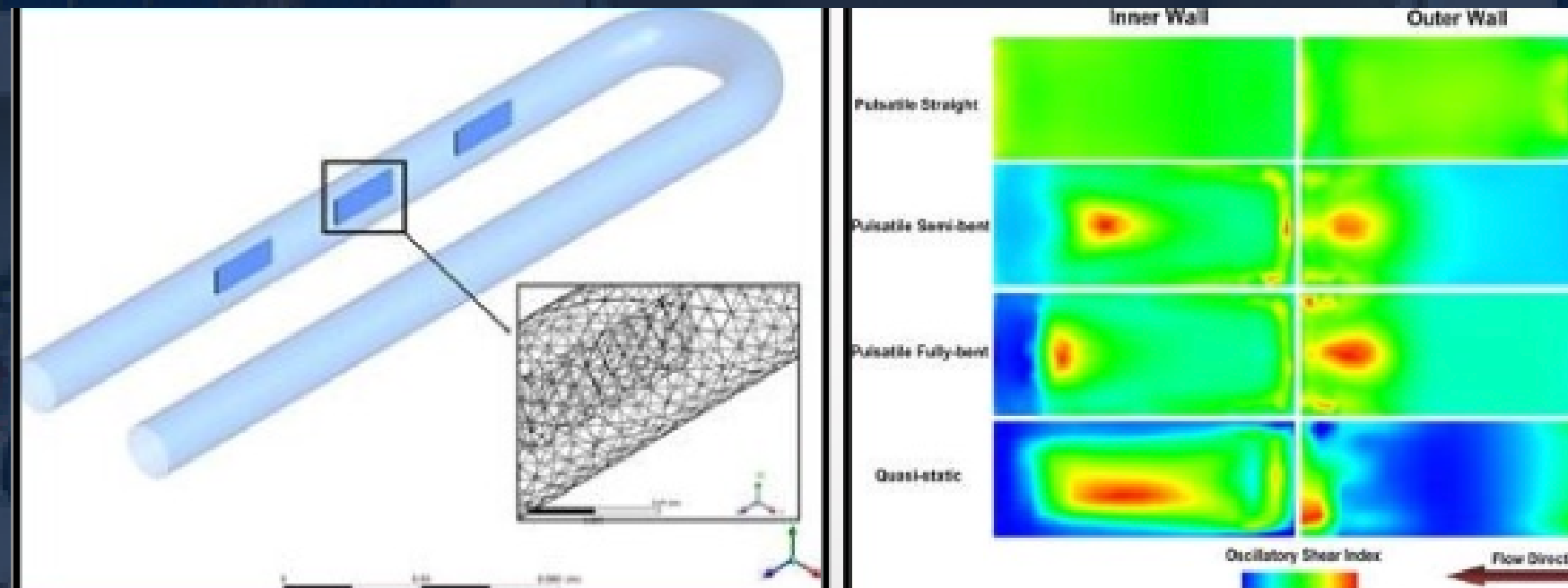
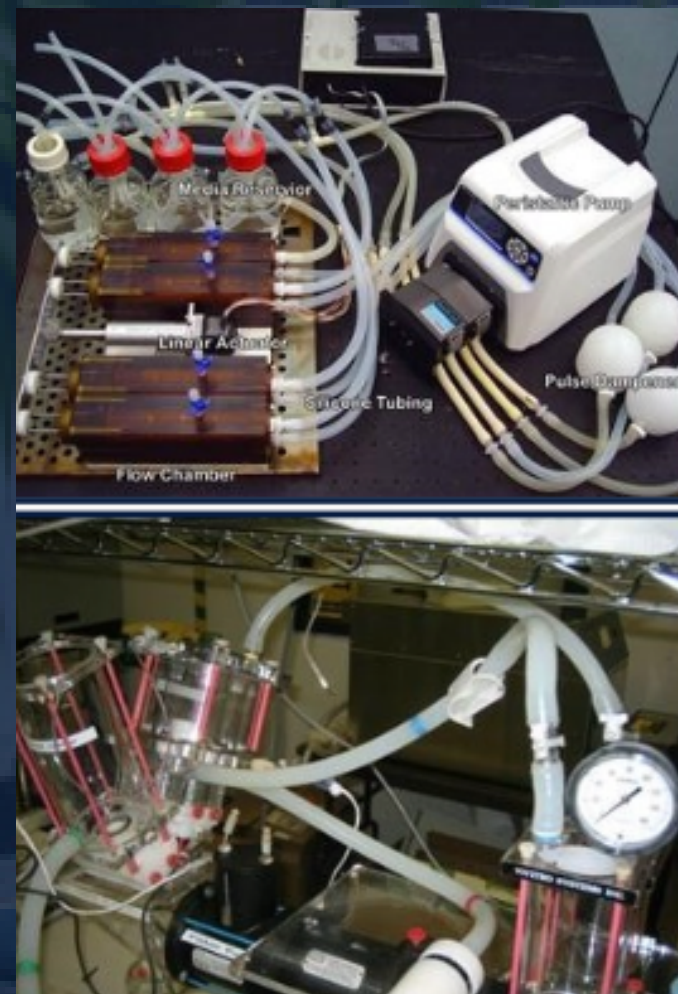






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Research Interests: Cell and tissue mechanics with application in cardiovascular regenerative medicine

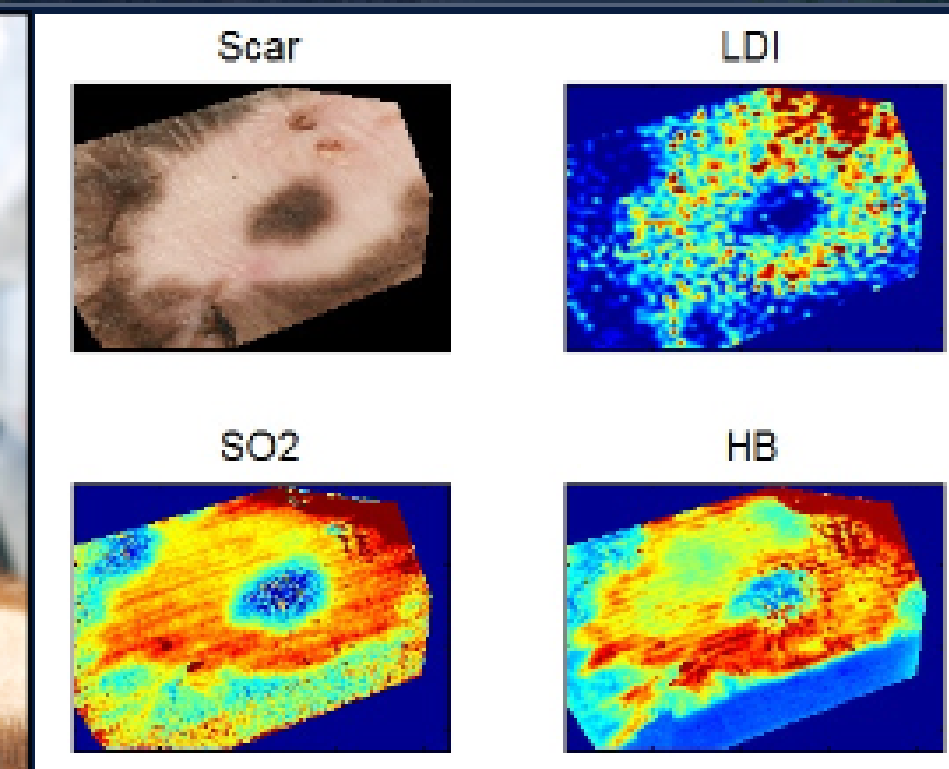
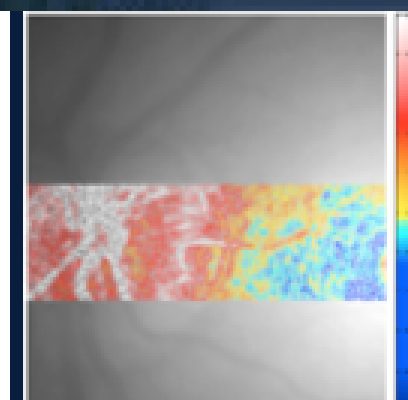
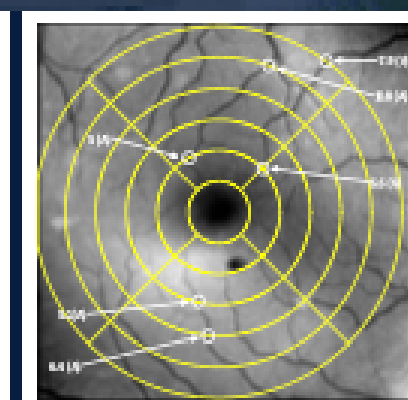
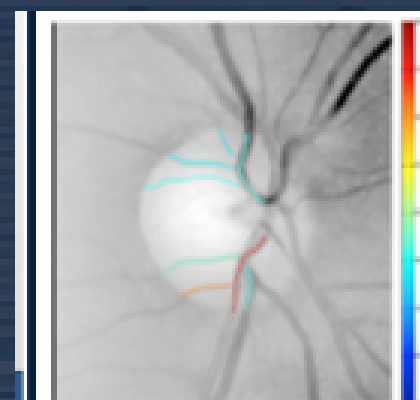
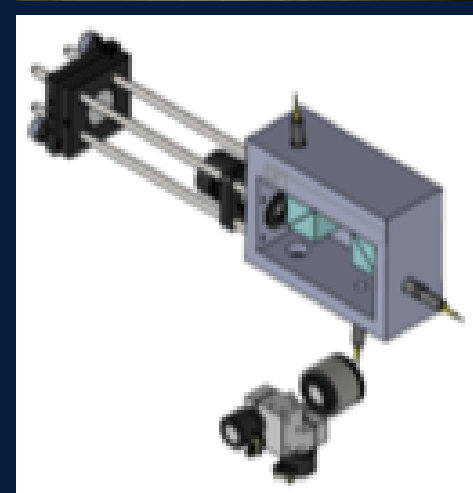
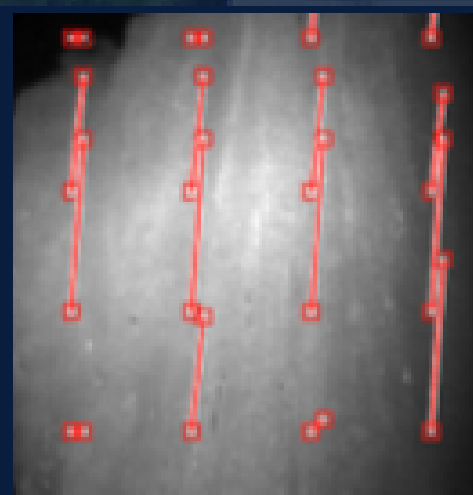
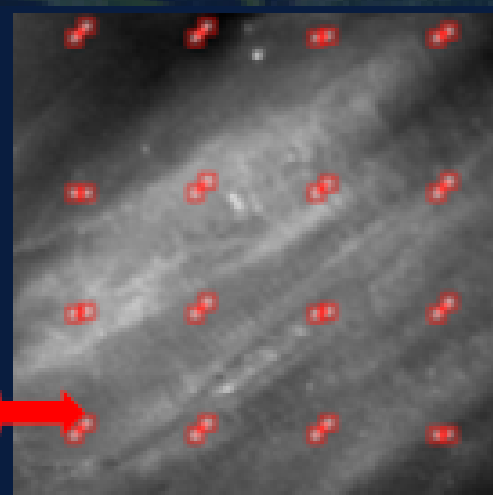
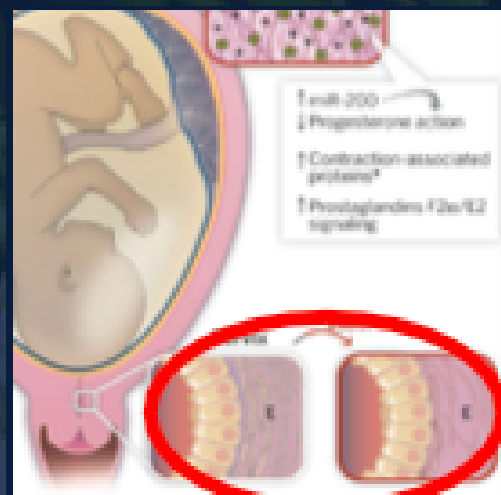






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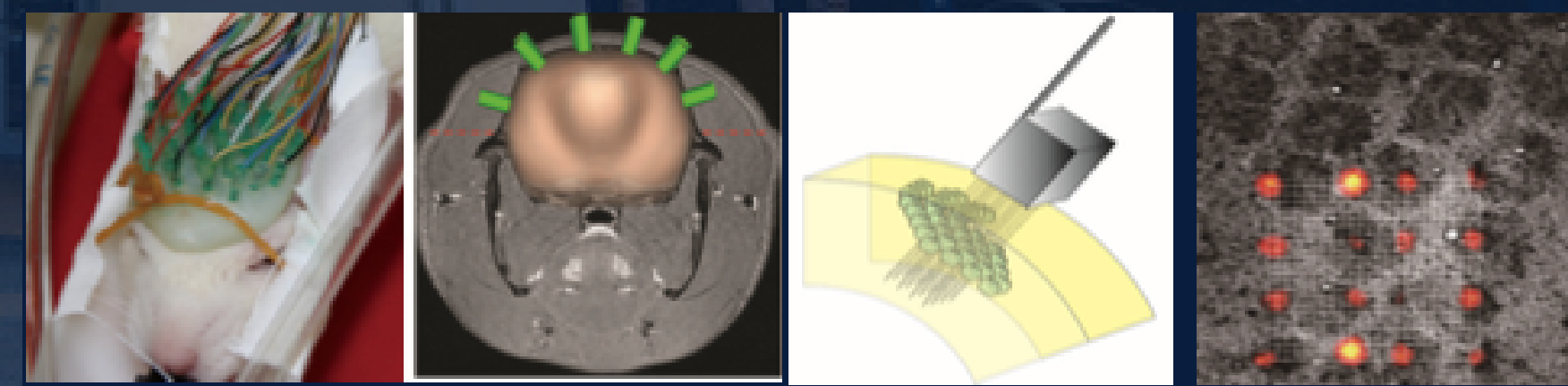
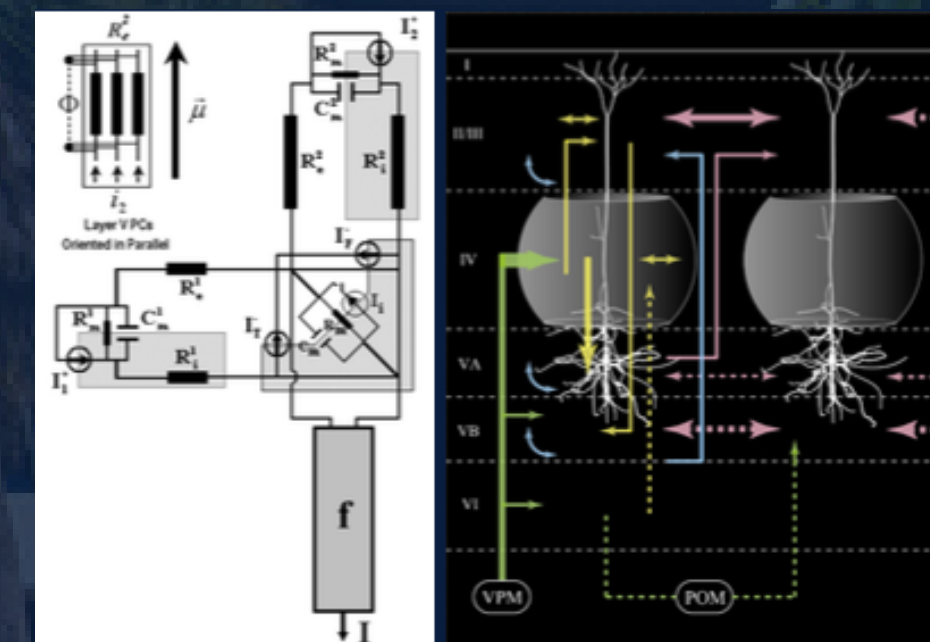
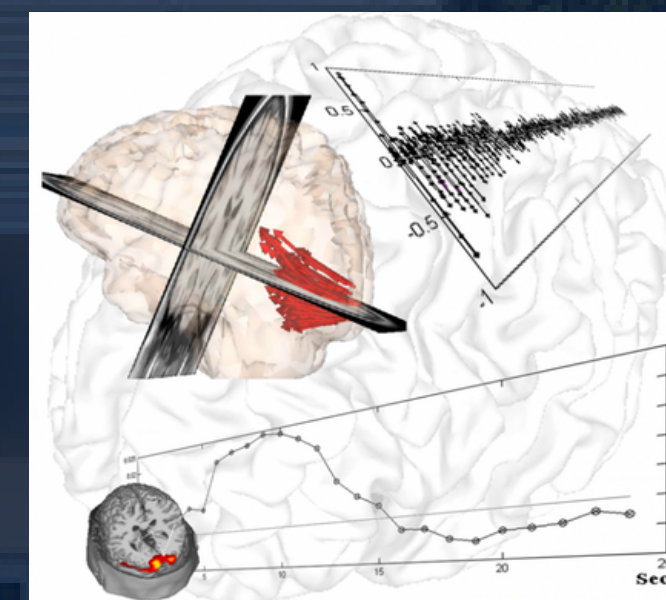
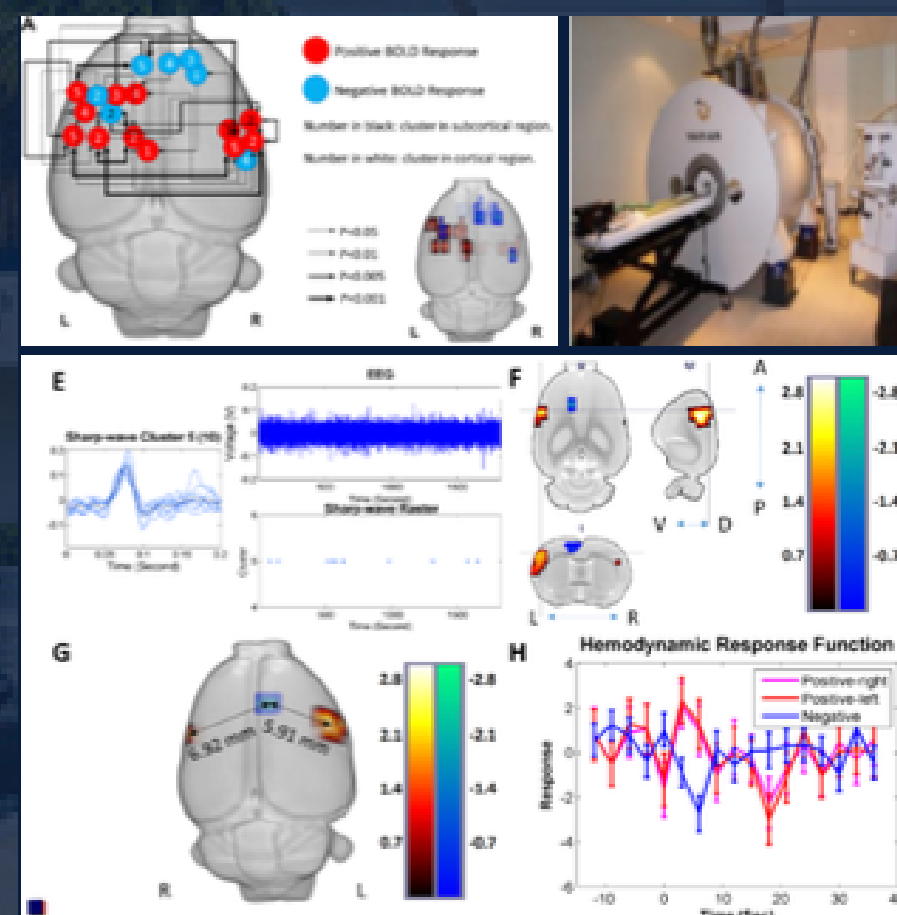
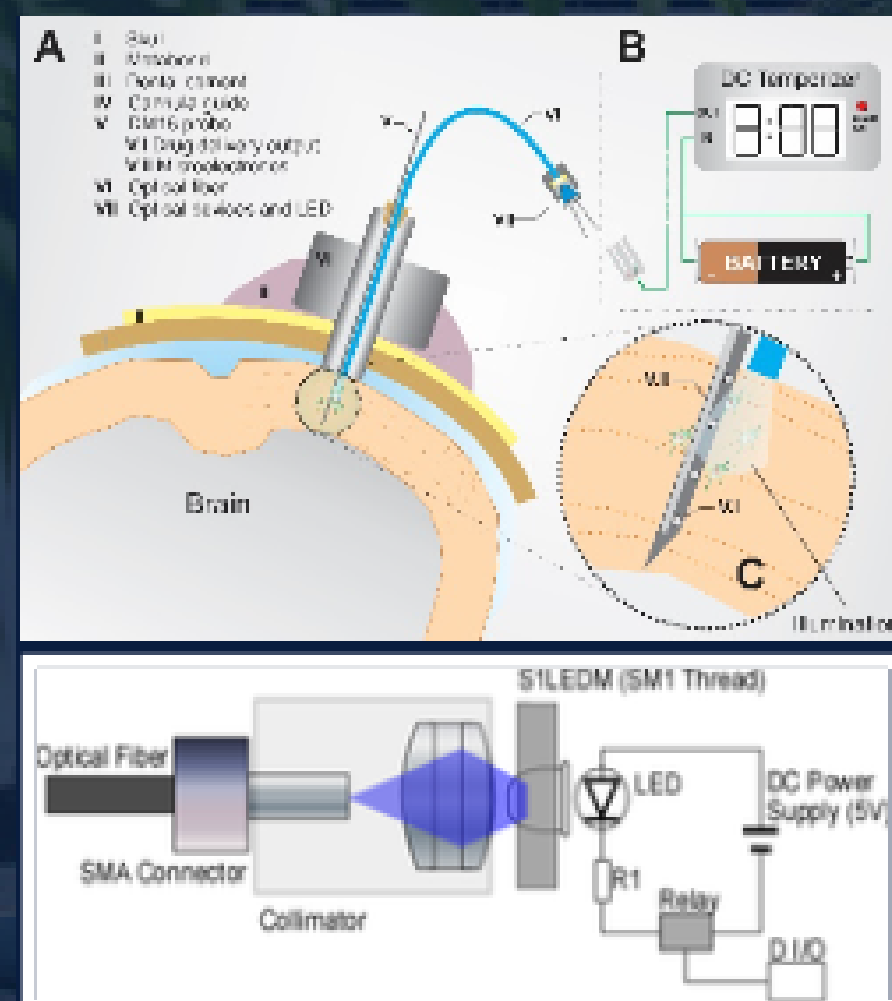
## Research Interests: Biophotonics





**Jorge Riera, Ph.D.**  
Associate Professor &  
Interim Chair of Biomedical Engineering  
[jrieradi@fiu.edu](mailto:jrieradi@fiu.edu)  
**305.348.4948 | EC 2602**

Research Interests: Biophysical Foundations of Neuroimaging in Normal Aging and Brain Disorders







**James Schummers, Ph.D.**

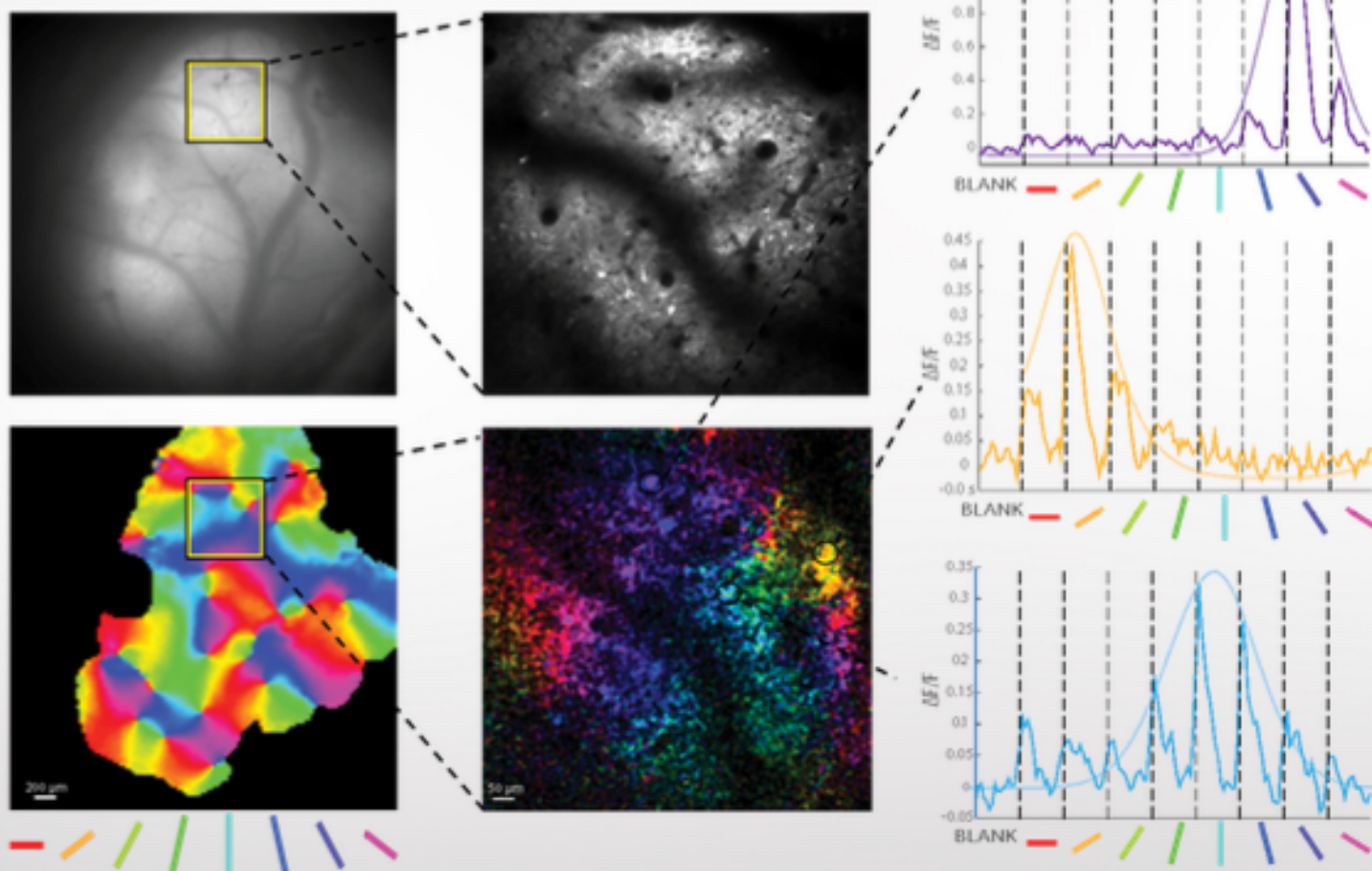
Associate Professor

[jshumme@fiu.edu](mailto:jshumme@fiu.edu)

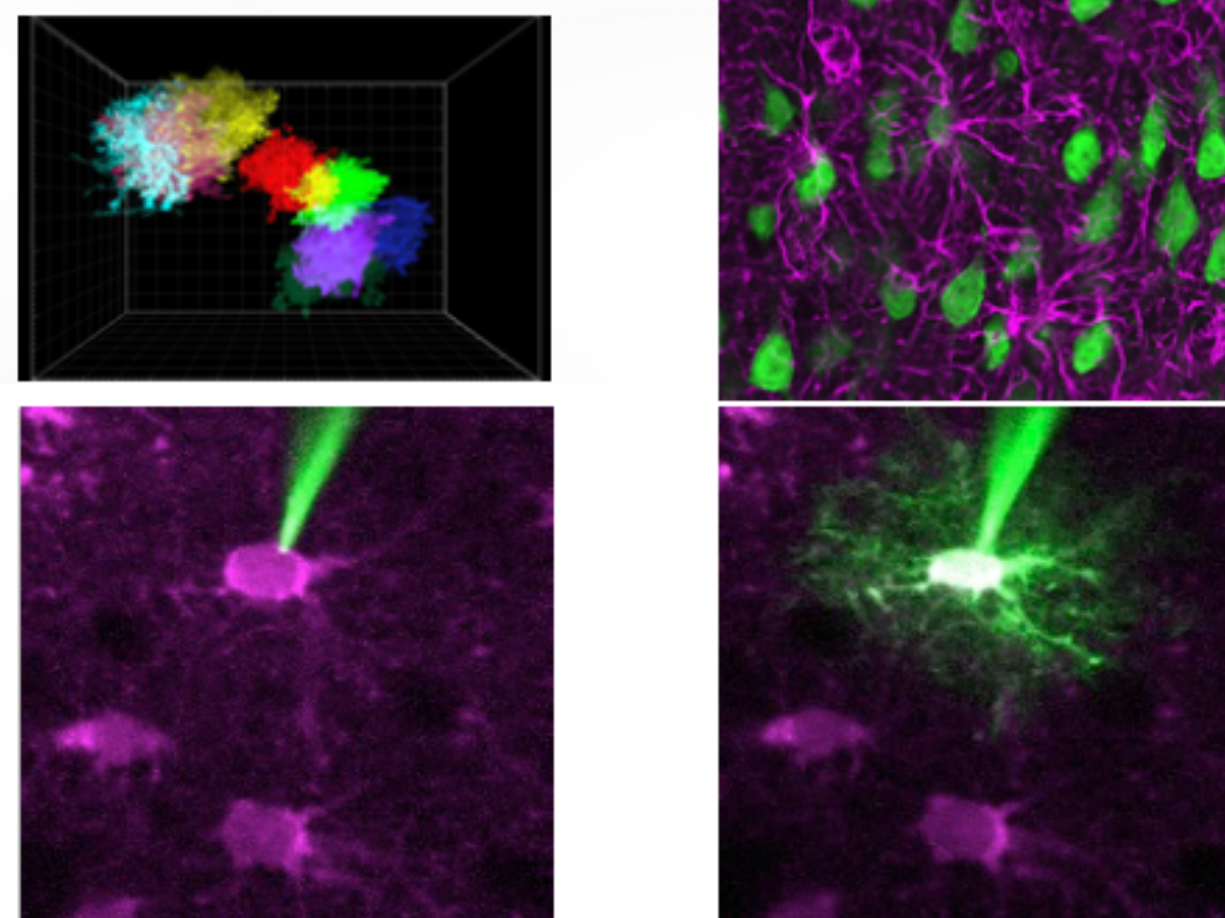
**305.348.0240 | EC 2653**

Research Interests: Diagnostic Bioimaging and Sensor Systems

### Widefield and two-photon microscopy of neuronal activity patterns visual cortex



### Interactions between neurons and astrocytes in the brain

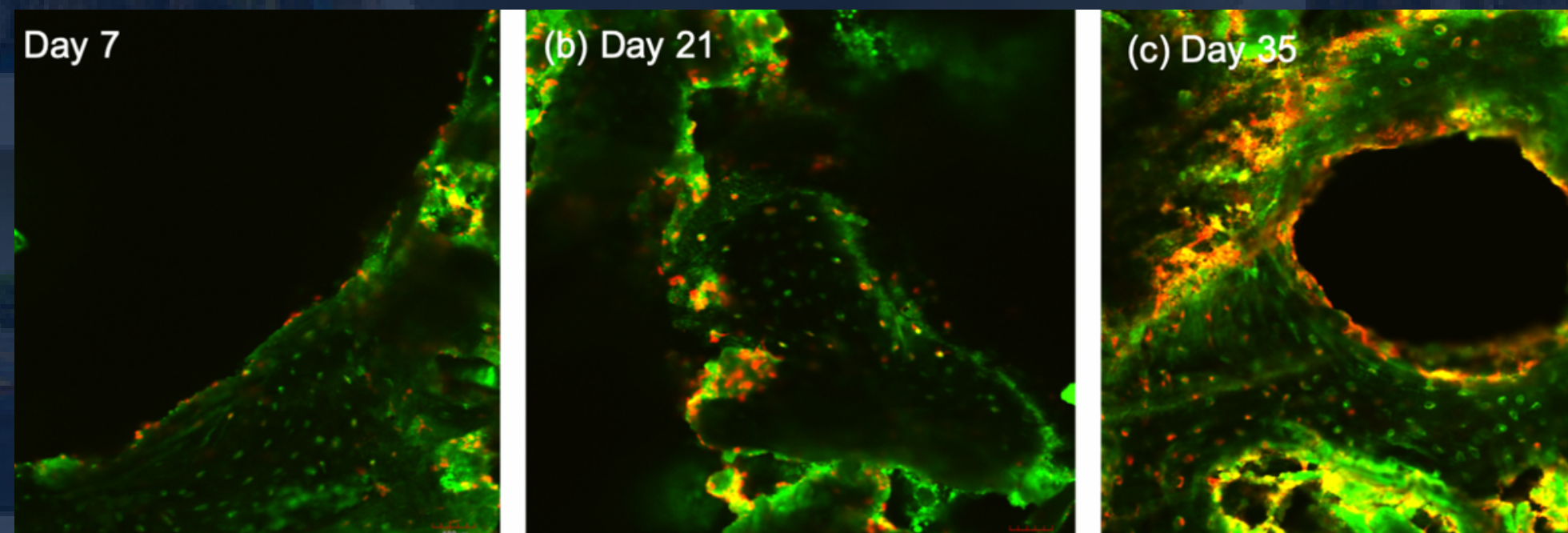






**Oleskii Shandra, Ph.D.**  
Assistant Professor  
**oshandra@fiu.edu**  
**305.348.----- | EC 2671**

Research Interests: Excitotoxic and metabolic abnormalities in the brain as a cause and/or consequence of seizures, Cellular and molecular mechanisms of sleep in health and disease, Pathophysiological mechanisms and neurological outcomes of fast ripple generation, propagation and coupling, Live brain calcium imaging and electrophysiology to investigate the complex interplay between neurons and astrocytes underlying excitatory and inhibitory transmission

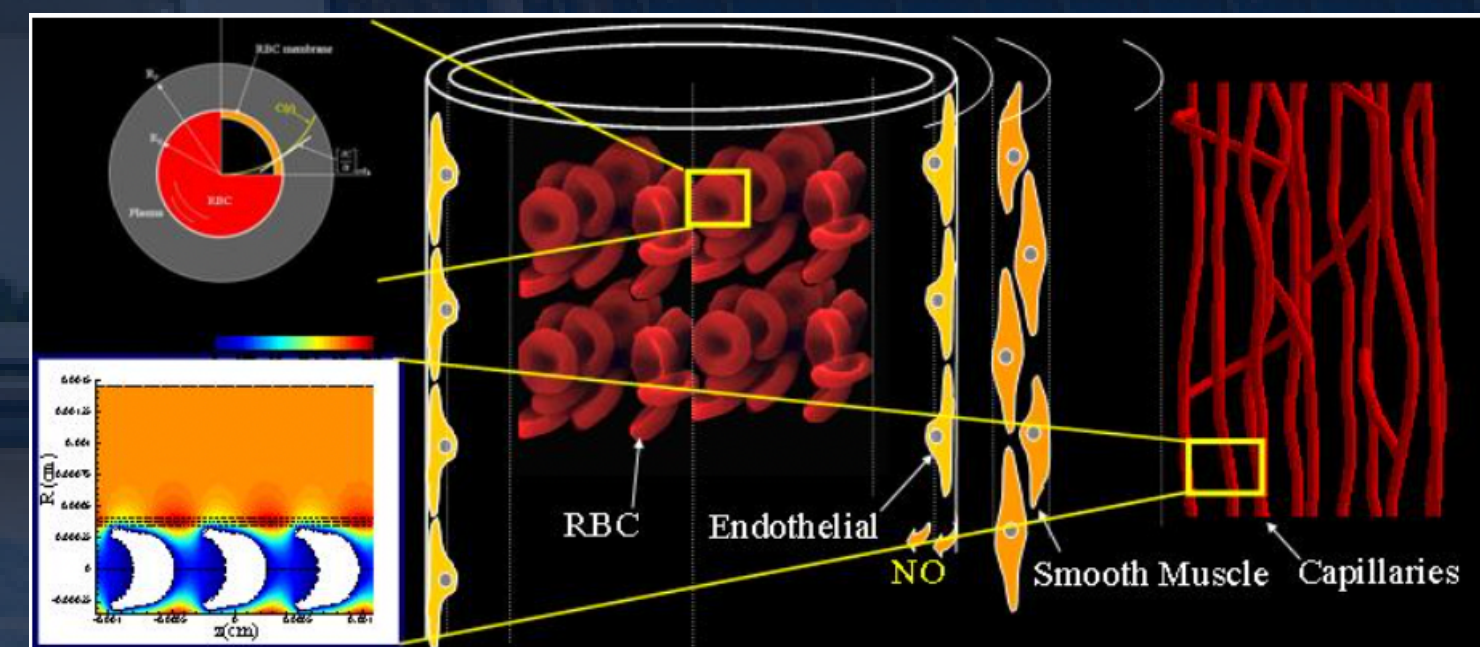
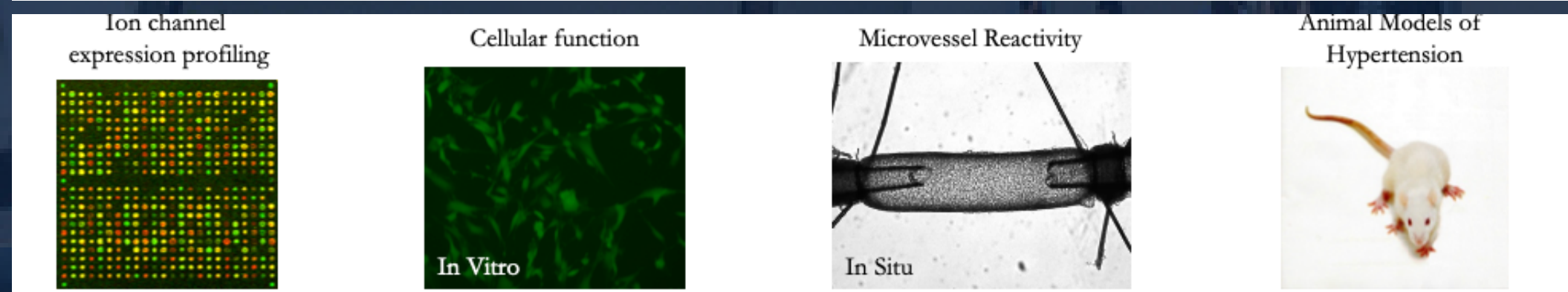
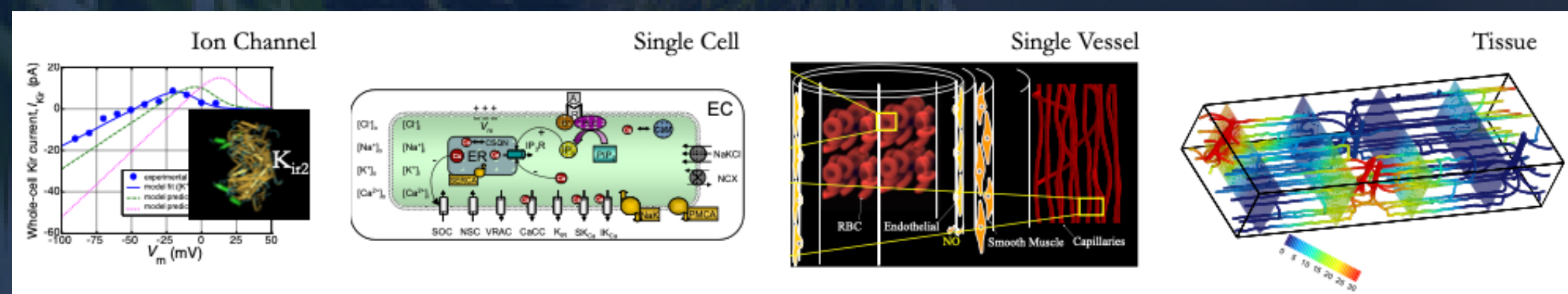
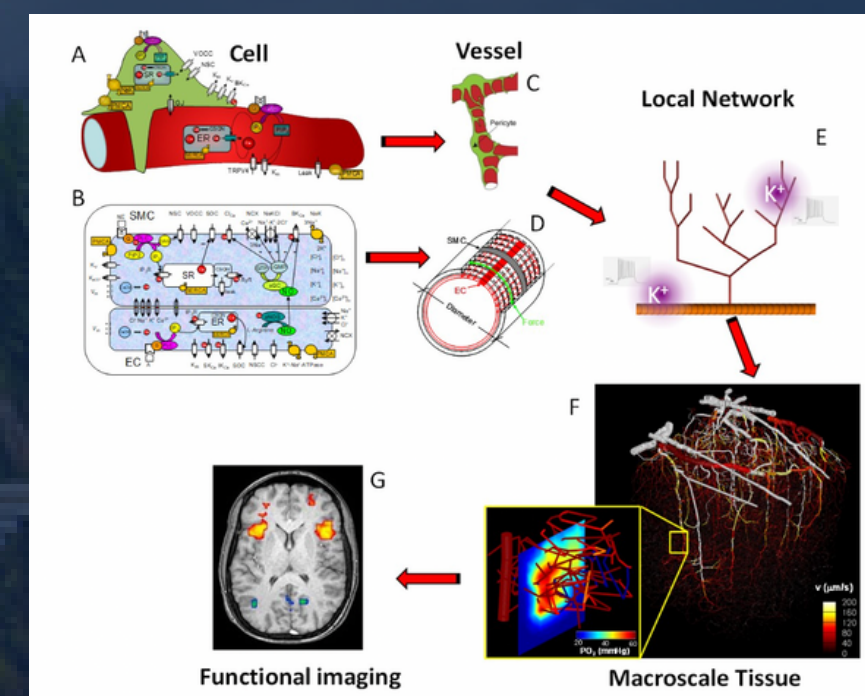






**Nikolaos Tsoukias, Ph.D.**  
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**305.348.7291 | EC 2674**

Research Interests: Computational and mathematical modeling, biotransport, signal transduction, cardiovascular and respiratory systems physiology



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