TOP 20 ranked graduate BME programs in the country, Vanderbilt is located just a little more than a mile from downtown Nashville. Graduate students are supported by several NIH T32 training grants including Developmental Determinants of Cardiovascular Disease, Engineering and Diabetes, Environmental Toxicology, the Medical Science Training Program (MSTP), Surgical and Interventional Engineering, and others.

Faculty and students enjoy close collaborations with adjacent to Vanderbilt University Medical Center, the only Level I trauma center in Middle Tennessee.

BME Professors Anita Mahadevan-Jansen and Cynthia Reinhart-King are elected incoming presidents of professional societies SPIE and BMES.

FACULTY

23 Tenure Track Faculty
4 Professors of the Practice
13 Research Faculty
29 AIMBE Fellows
8 BMES Fellows
1 National Academy of Engineering Fellow

STUDENTS

128 PhD Students
19 NSF Graduate Research Fellows
5 NIH NRSA Fellows
5 NIH T32 Trainees
2 Other external fellowships (NDSEG, etc.)

RESEARCH

>$33M Research funding
41 Active NIH grants
98 U.S. patents filed
20 Patent licenses executed
BIOMATERIALS AND DRUG DELIVERY

JONATHAN BRUNGER: Synthetic biology and genome engineering; mimetics design
CRAIG DUVAL: Intracellular delivery; biomaterials for wound healing; molecularly-targeted therapeutics
TODD GIORGIO: 'Smart' nanoscale gene and drug delivery agents for cancer immunotherapy
MICHAEL KING: Nanoscale liposomes and nanoparticles; genetic/molecular engineering for targeted drug delivery
CYNTHIA REINHART-KING: Biomaterials for engineered models of disease progression

BIOMECHANICS AND MECHANOBIOLOGY

JONATHAN BRUNGER: Musculoskeletal mechanobiology; biomechanics/stem cell behaviors
BRETT BYRAM: Shear wave based soft tissue mechanical assessment for disease staging
CRAIG DUVAL: Procedural (surgery/angioplasty) injury and impacts on restenosis; post-traumatic osteoarthritis
MICHAEL KING: Mechanotransduction of cancer and blood cells; physical mechanisms of cancer metastasis
W. DAVID MERRYMAN: Mechanobiology of cardiopulmonary fibrosis in hypertension, heart failure, and valve disease
MICHAEL MIGA: Soft-tissue biomechanics and biotransport for image-guided surgery; biomechanics for therapeutic forecasting
CYNTHIA REINHART-KING: Mechanics of tissues and cells in metastasis, angiogenesis, and atherosclerosis
JOHN WIKSWO: Biological physics; cardiac/cellular electrophysiology; cellular instrumentation/control; non-linear dynamics

MEDICAL DEVICES AND MODELING

FRANZ BAUDENBACHER: Cyber physical systems for diagnostics and disease management
BRETT BYRAM: Low-cost devices for point-of-care diagnostics and ultrasonic wave propagation modeling
CHRISTOS CONSTANTINIDIS: Deep Brain Stimulation; modeling of neural activity during cognitive functions
TODD GIORGIO: Early detection/advanced treatment devices for sepsis; advanced biosensing
W. DAVID MERRYMAN: Development of novel percutaneous devices to treat cardiac diseases
MICHAEL MIGA: Modeling/simulation for image guided surgery, therapy delivery assistance, and tissue measurements
MIKAIL RUBINOVA: Network analysis/modeling of large-scale structural/functional brain circuits; whole-brain organization
YUANKAI (KENNY) TAO: Optical imaging systems for point-of-care ophthalmic diagnostics and surgical guidance
XIN (MAIZIE) ZHOU: Uncover brain maturation mechanisms through artificial and natural neural network models

MEDICAL IMAGING

ADAM ANDERSON: MRI of the brain, including functional MRI and diffusion tensor imaging
JUSTIN BABA: Functional brain imaging; neurophysiological, intracranial recordings; computational analysis/modeling
FRANZ BAUDENBACHER: Functional optical imaging in isolated heart preparations to study arrhythmogenesis
BRETT BYRAM: Ultrasound beamforming/front-end processing for improved imaging; non-contrast perfusion imaging
MARK DOES: Quantitative MRI methods for characterizing white matter microstructure and bone fragility
JOHN GORE: Development and application of biomedical imaging techniques
WILL GRISSOM: RF pulses and parallel excitation systems for ultra-high field MRI, MRI for guided interventions
ANITA MAHADEVAN-JANSEN: Optical imaging approaches for real time diagnosis and guidance of surgery
XIN (MAIZIE) ZHOU: Personal and cancer genome reconstruction; structural variant detection from sequencing data

BIOMEDICAL PHOTONICS

JUSTIN BABA: Polarimetric imaging and sensing for non-invasive diagnostics and therapeutics
AUDREY BOWDEN: Optical technologies for cancer detection, brain imaging and point-of-care diagnostics and therapy
E. DUO JANS: Laser-tissue interaction; infrared modulation of neural activity; optical technologies in medicine and biology
ANITA MAHADEVAN-JANSEN: Optical technologies for real-time disease diagnosis and surgical-guidance
YUANKAI (KENNY) TAO: High-throughput optical imaging of retinal angiogenesis and regeneration

LOW RESOURCE AND MICROFLUIDIC DIAGNOSTICS

FRANZ BAUDENBACHER: NanoCalorimeter-based point-of-care assays for infectious/metabolic disease diagnosis
AUDREY BOWDEN: Light-based, low-cost technologies for point-of-care diagnostics and therapy
FREDERICK HASSELTON: Low resource biomarker-based diagnostic devices for infectious diseases
ANITA MAHADEVAN-JANSEN: Novel light-based technologies to solve specific challenges in global health
CYNTHIA REINHART-KING: Microfluidics and microfabricated devices to study disease progression

CONTACT US

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IMPORTANT DATES

JAN 1: Application Deadline
MAR 10-12: Campus Visit
APR 15: Admissions Deadline