Your continued support is vital to the success of our department. You may designate your support towards the BE department, student awards, or to support a specific research lab. For more information about how your donations can help transform the BE Department, please contact Laura Brock at laura.brock@louisville.edu, or call (502)852-1017.
MedTek, a Louisville based neurodiagnostic design firm, which recently secured both CE and FDA clearance on their first product. Olivia enjoys engaging with the innovation and entrepreneurship community in Louisville, and spends her free time rock climbing, racing triathlons, and teaching Irish dancing.

Hadley Hendricks

Hadley Hendricks has won the Tachau Essay Contest named in honor of Mary K. Bonsteel Tachau. The award is presented to raise awareness of the historical sociological attitudes toward women of the 20th Century and their impact on individuals and society as a whole. She is the president of the Women 4 Student Board and chair of the 2016 College Women's Leadership Conference. She returns for her final co-op in the spring with Cook Medical.

Sydney Lucas

Sydney Lucas is a first-generation college student and Porter Scholar. She stays active on campus, serving as operations vice president for the Speed School Student Council, which correlates with a senator position on the Student Government Association. She has also finished three co-op rotations, including two with the Kentucky Spinal Cord Injury Research Center. Now, she's closing in on a degree in bioengineering, which she calls a “perfect fit” for her.

“Bioengineering is such a great field because it’s so broad and open. It opens you up to doing either the basic science side and research, it offers the more technical side, if you went into pharmaceuticals or something like that. It’s also directly still correlated with patients and helping people,” Lucas said.

Lucas is on track to graduate in May. She then plans to pursue her master’s degree, also in bioengineering.

Mickey Ising

I graduated in 2011 with an M.Eng from the department of Bioengineering. I completed my co-ops and M.Eng under the mentorship of Drs. Mark Slaughter, Guruprasad Giridharan, and Steven Koenig and worked in their advanced heart failure research labs. During this research experience, I heard my calling to be a physician and subsequently entered medical school at UofL in 2011. Throughout medical school, I continued working with Drs. Slaughter, Giridharan, and Koenig authoring several peer-reviewed manuscripts. My academic and curricular accomplishments were recognized with the American Society of Artificial Organ's Young Innovator Fellowship, Southern Thoracic Surgical Association's James W. Brooks Medical Student Scholarship, and the American Medical Association's Physician of Tomorrow Award.

I completed my medical education in May of 2015. I am currently completing my general surgery residency at the University of Louisville and plan to be a Cardiovascular and Thoracic Surgeon. Throughout my medical education and surgical residency, my engineering education has consistently been integral in understanding complex systems and problem solving. I cannot thank the BE department enough for providing me with excellent education, mentorship, and research opportunities for advancing my career.

This interdisciplinary study of cancer requires that experimental and clinical data drive the computational and modeling work. The aim of Dr. Frieboes’ research is to predict tumor behavior from the molecular and cellular scale events, with the ultimate goal to help guide the treatment of individual patients. His novel research intersects the fields of cancer biology, scientific computing, data visualization, mathematical biology, and physical oncology.

Ongoing studies in Dr. Frieboes’ lab can be divided into the following scientific areas:

1. Prediction of tumor progression as a function of molecular- and cell-scale events;
2. Characterization of treatment response by integration of modeling and experimentation;
3. Advancement of mathematical modeling and computational techniques to characterize tumor growth;

Dr. Frieboes has mentored numerous undergraduate students from a variety of majors as research volunteers in his laboratory to study the growth of tumors in the laboratory and to sim-
The University Of Louisville Department Of Bioengineering received the $5 Million Translational Partnership Award in 2011 by the Wallace H. Coulter Foundation. The award placed U of L in the “Sweet 16” of the US Institutions in the area of Translational Research. The Coulter Translational Partnership at the University of Louisville is an interdisciplinary program aimed at catalyzing biomedical innovation by providing gap funding, training, and mentorship to engineer-clinician teams, with the goal of bringing cutting-edge biomedical research out of the university to improve human health by advancing development of these technologies. (https://louisville.edu/speed/bioengineering/coulter-grant/coulter-grant.html#Mission).

OUTCOMES

Since 2011, the UofL-Coulter program has enhanced the research enterprise at UofL by:

- Establishing more than 50 new collaborations between the engineering and medical campuses
- Encouraging inventors to submit more than 60 new invention disclosures
- Providing more than $2.85 Million support over 17 projects.

The UofL-Coulter Program funded projects have included a broad range of clinical indications and scientific areas, from cancer, surgery, cardiovascular, orthopedics, and ophthalmology, to devices, drug delivery, healthcare IT, imaging and diagnostics. As of November 2017, these funded projects have led to:

- 5 Technologies licensed to private companies
- $1.7 Million in external grant funding to UofL and private companies
- $1.19 Million in private equity investment to 4 startup companies
- 4 products in clinical studies
- 8 startup companies

LICENSED TECHNOLOGIES

MRI Based System for Early Diagnosis of Autism
Inventors: A El-Baz, PhD, M Casanova, MD, M Nitzken, PhD

Implantable Gel to Prevent Cataract Formation Following Retinal Surgery
Inventors: M O’Toole, PhD, S Schaal, MD, PhD, T Tezel, MD, A Gobin, PhD, O Braun

Left Atrial Appendage Closure Device for Stroke Prevention in Patients with Atrial Fibrillation
Inventors: G Giridharan, PhD, M Slaughter, MD, S Koenig, PhD, M Sobieski, RN, K Soucy, PhD

Diagnosis of Lung Cancer by Breath Analysis Using Silicone Microchip
Inventors: X Fu, PhD, M Bousamra, MD, V van Berkel, MD, PhD, M Nantz, PhD.

Treadmill System for Neuromuscular Training of Children with Spinal Cord Injury
Inventors: T Roussel, PhD, A Behman, PT, PhD, S Harkema, PhD, D Howland, PhD, R Cheng, PhD, J Allen, S Trimble, PT, Y Chen, PhD

ADDITIONAL TECHNOLOGIES IN DEVELOPMENT

Development of a Novel, Open-Jaw Polypectomy Snare Device

Suction Assisted Multiple Biopsy Sample Device

A Non Invasive CAD System for Early Detection of Acute Renal Rejection

Virtual Manager to Assist Caregivers of Dementia Patients

SIVIC for Establishing Secure Endoscopic Access to the Gastrointestinal Tract

Shape Adaptive Tumor Therapy

Treatment of Cervical Pathologies by Curcumin Delivered Locally by a Polymeric Device

Novel Trocar Site Closure Device

Towards Improved Radiation Therapy of Triple Negative Breast Cancer

Impartial Automated Diagnosis of Retinal Diseases using a Novel OCT Calibration System

Directional Orthopedic Reamer Device

CAD System for Early Lung Cancer Diagnosis from Single CT Scan
Awards

The following BE faculty received grants & industry contracts totaling $6M in 2017:

G. Bertocci (NIJ)
K. Bertocci (NIJ)
A. El-Baz (NIH, SPARC, NSF I-Corps)
J. Kopechek (AHA, NSF I-Corps, EXCITE)
S. Koenig (2 NIH SBIRs, 2 Industry Contracts, NIH RoI Subcontract)
G. Giridharan (AHA, 2 NIH SBIRs)
T. Roussel (NSF I-Corps)
M. O'Toole (NIH T35, JHF, KEDFA)

Yitzhak (Isaac) Gebru

Yitzhak Gebru, a 2017 M.Eng graduate of the Department of Bioengineering, has created start-up company (Fourth Dimension) to commercialize the renalCAD technology with Dr. Ayman El-Baz.

Last year, funding from I-Corps enabled Mr. Gebru to complete a UofL Foundation-sponsored training course for upstart businesses called LaunchIt. Funding from AWARE:ACCESS and NSF I-Corps programs aimed to get entrepreneurs and their inventions to the marketplace more quickly and successfully. The group has applied for patent protection and is collaborating with the University of Michigan on a clinical study.

DesiCorp Wins LaunchIt Internal Pitch Competition

An interdisciplinary UofL team (DesiCorp) developing a novel way of drying blood to enable stability at room temperature, won the Fall 2017 LaunchIt internal pitch competition. Human blood at blood banks has a limited shelf life and has to be refrigerated, which exacerbates the donor blood shortage, and limits the transportation and use of blood products. The proprietary technology developed by the DesiCorp team to dry blood prolongs the shelf life and eliminates the need for refrigeration. The dried blood can be easily rehydrated just before a blood transfusion. The DesiCorp team consists of BE faculty member Dr. Jonathan Kopechek along with Brett Janis, Michael Menze, Jackie Willmot, and Bob Saunders.

Renal CAD wins three translational grants

A novel technology for detecting renal rejection developed by BE Department Chair Dr. Ayman El-Baz is the first University of Louisville project to receive money from three major translational research funding sources. Dr. El-Baz began looking for a non-invasive, less expensive way to detect signs of renal rejection in 2004 when his cousin suffered kidney failure and needed a transplant.

El-Baz and Drs. Amy Dwyer and Garth Beache in the UofL School of Medicine worked together to develop RenalCAD, which uses an MRI instead of a biopsy to find signs of renal rejection.

The project has now been funded by the Coulter Translational Partnership, NSF I-Corps, and NSF AWARE:ACCESS, three funding programs aimed to get entrepreneurs and their inventions to the marketplace more quickly and successfully. The group has applied for patent protection and is collaborating with the University of Michigan on a clinical study.

BMES Spotlight

The UofL Biomedical Engineering Society student chapter held their second annual 5k Run/Walk on Nov 3, 2017. The event promotes student, faculty, and staff interaction and raised funds towards BMES sponsored activities. Race awards included fastest male and female students, fastest alumni, and fastest faculty. The event was a great success with over 40 participants.

BMES sponsored students to attend the 2017 annual BMES conference in Phoenix, AZ. BMES student volunteers and faculty manned the UofL BE Department booth at the conference and disseminated information about our undergraduate and graduate programs to enhance the visibility of our BE programs and promote enrollment. Our students and faculty presented 6 oral and 12 poster presentations.

BE grants

The following BE faculty received grants & industry contracts totaling $6M in 2017:

G. Bertocci (NIJ)
K. Bertocci (NIJ)
A. El-Baz (NIH, SPARC, NSF I-Corps)
J. Kopechek (AHA, NSF I-Corps, EXCITE)
S. Koenig (2 NIH SBIRs, 2 Industry Contracts, NIH RoI Subcontract)
G. Giridharan (AHA, 2 NIH SBIRs)
T. Roussel (NSF I-Corps)
M. O'Toole (NIH T35, JHF, KEDFA)