



IUPUI

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School of Engineering
and Technology

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BME Seminar Schedule 2017

DATE	SPEAKER/EVENT	DEPARTMENT/TOPIC
1-Sep-17	BME GSA	Student-Led Seminar
8-Sep-17	Ed Berbari	IUPUI Biomedical Engineering
15-Sep-17	BME GSA	Student-Led Seminar
22-Sep-17	Sharon Miller	IUPUI Biomedical Engineering
29-Sep-17	BME GSA	Student-Led Seminar
6-Oct-17	Ken Yoshida	IUPUI Biomedical Engineering
13-Oct-17	Nilsson Holguin	IUPUI Mechanical Engineering
20-Oct-17	BME GSA	Student-Led Seminar
27-Oct-17	William Thompson	IUPUI Physical Therapy
3-Nov-17	BME GSA	Student-Led Seminar
10-Nov-17	BME GSA	Student-Led Seminar
17-Nov-17	Bonnie Blazer-Yost	IUPUI Biology
24-Nov-17	THANKSGIVING	Enjoy your break!
1-Dec-17	BME GSA	Student Led Seminar

Research Areas of BME Faculty

BIOSIGNALS & NEURAL ENGINEERING

Ken Yoshida, Ph.D., Associate Professor
John Schild, Ph.D., Associate Professor
Karen Alfrey, Ph.D., Associate Chair of Biomedical
Engineering & Clinical Associate Professor

CELLULAR BIOMECHANICS

Hiroki Yokota, Ph.D., Professor
Joseph Wallace, Ph.D., Associate Professor

BIOMATERIALS & TISSUE ENGINEERING

Chien-Chi Lin, Ph.D., Associate Professor
Dong Xie, Ph.D., Associate Professor
Steven Higbee, Ph.D., Clinical Associate
Professor
Sharon Miller, Ph.D., Visiting Clinical
Associate Professor

SYSTEMS BIOMECHANICS

Sungsoo Na, Ph.D., Associate Professor
Julie Ji, Ph.D., Associate Professor
Bill Combs, MSEE, Clinical Associate Professor
Edward Berbari, Ph.D., Chancellor's Professor,
Chair of Biomedical Engineering

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DEPARTMENT OF
BIOMEDICAL ENGINEERING
SCHOOL OF ENGINEERING AND TECHNOLOGY
Indiana University—Purdue University
Indianapolis



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THE BME NETWORK

Newsletter of the Department of Biomedical Engineering

Students Showcase

Featuring: Tolu Ajayi & Kathryn Peterson

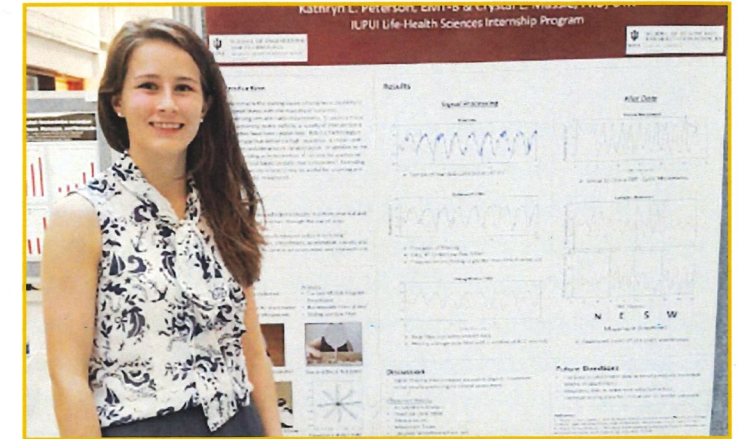


Tolu Ajayi | IU School of Medicine (Simon Cancer Center)

"Being involved in research helped strengthen my classroom knowledge, allowed me to see how BME principles can be applied towards various areas of medicine, and clarified my career path."

Project: Development and Validation of a 3D Micro-Chip for the Study of Pancreatic Cancer

Pancreatic ductal adenocarcinoma (PDAC) is the third leading cause of cancer-related deaths in the United States, with an overall five-year survival rate of 8%. This is partly due to the lack of effective models that simulate the complex PDAC tumor microenvironment and allow for high throughput drug screening. Some of the key features of the PDAC tumor microenvironment are the presence of a dense stroma that impedes effective drug delivery to the pancreatic cancer cells (PCCs), as well as the presence of cancer associated fibroblasts (CAFs) that have been shown to modulate disease progression. The objective of this project is to develop an in vitro microfluidic cell culture system that allows researchers to recapitulate the PDAC tumor environment, allowing an effective analysis of the PDAC environment.



Kathryn L Peterson | IU School of Health and Rehabilitation Sciences

"Having the opportunity to do research has allowed me to see the skills that I am learning in the classroom and apply them towards solving problems in the world of rehab and affecting patients' lives."

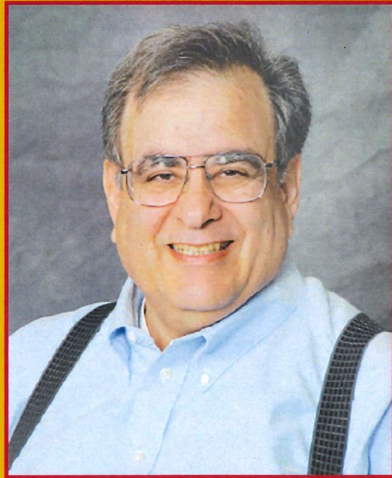
Project: Analyzing Accelerometer Data to Assess Stroke Rehabilitation

Mentor: Crystal L. Massie, PhD, OTR – IU School of Health and Rehabilitation Sciences

Project: Stroke remains the leading cause of long-term disability in the United States with the majority of survivors experiencing arm and hand impairments. In an effort to mimic and extend analysis and interventional techniques addressing upper extremity motor deficits, Kathryn has researched the potential of using wrist accelerometers. Through using various signal processing techniques, she have converted the raw accelerometer data from these devices into a useful output that can be analyzed.

Kathryn and the research team are now collecting and analyzing data from the accelerometer compared to simultaneous recorded robotic measurements in order to ensure accuracy.

Message from the Chair



Edward J. Barbari
Chancellor's Professor
and Chair of Biomedical
Engineering

A quick follow-up to our 2016 newsletter. Our ABET visit has gone through the yearlong evaluation process. It is good news to report that our program continues to be accredited until our next general review in 2022.

Our newsletter focus this year is on undergraduate research activity in the department. Dr. Steve Higbee continues as the Coordinator of Undergraduate Research. Due to his involvement and efforts, we have seen a significant rise in student participation. There is, in fact, a page on our web site highlighting several of these projects (<http://www.engr.iupui.edu/departments/bme/research/undergraduate-research.php>).

There are many reasons we encourage and support our students to consider pursuing these projects, as they give them some insight into the research process. Primary among these reasons, it allows the students an opportunity to apply their newly-gained knowledge and skills from their course work into a laboratory research project with long-term benefits for others. Many of these projects are competitively funded by the campus. Our BME students are among the most successful recipients of these awards.

In other department news, we are proud to note that Dr. Karen Alfrey has been chosen by Dean Russomanno to the school-wide position as Associate Dean of Undergraduate Academic Affairs and Programs, effective January 1, 2018. While she will remain a BME faculty member, her departmental responsibilities will be reduced to teaching one course per year. We will surely miss her daily presence in the department and her steady hand as the Associate Chair and Director of the Undergraduate Program. A warm welcome to Dr. Sharon Miller, Visiting Clinical Associate Professor, as the newest BME faculty member. She will take over Dr. Alfrey's responsibilities as she transitions to the Dean's office. Dr. Miller received her PhD from the University of Michigan. Watch for a Dr. Miller highlight in a future edition of our newsletter. Research expenditures were over \$1.2 million in the last fiscal year and were from many sources, notably, NIH, NSF, foundations, and industry.

Breaking News We were just notified of the formal approval of our 5-year combined BSBME/MSBME degree program. This new program will be available to our current junior class, as the applications are made in the spring semester of the junior year.

Undergraduate Student Awards: Several of our BSBME students received various awards as members of the 17th Annual IUPUI Top 100 Outstanding Students, recognizing them for scholastic achievement, extracurricular activities on campus, to civic and community service. They are Kyle McElyea, Landan Mintch, and Lillie Wolter as three of the Top100/ Tolulope Ajayi as Exemplary Internship or Research Award recipient/ Trang Pham as Biomedical Engineering Outstanding Service Award recipient/Tyler Hudgens as Outstanding Engineering Dual Degree BME Student Award recipient/Brian Frondorf as Charles H. Turner Award for Outstanding Academic Performance in the Senior Year recipient/

Shozaf Zaidi as Bepko Award for Outstanding Academic Achievement for the Junior Year recipient/Alexis Lewandowski as Bepko Award for Outstanding Academic Achievement for the Sophomore Year recipient/Leah Meador as Bepko Continuing BME Student Scholarship recipient. Congratulations to all these students for a job well done!

Student Showcase Continued from page 1



Joel Ng | IU School of Medicine (Simon Cancer Center)

"I've learned a lot about cancer, what goes into developing treatments, and a lot about cellular pathways. I hope to get more involved in the clinical aspects of this research."

Project: Genetic Sequencing for Triple Negative Breast Cancer (TNBC) Drug Screening

Over the summer I have continued to in the lab of Dr. Milan Radovich, PhD & Jeff Solzak, MS - Indiana University School of Medicine (Surgery).

In the lab we focus on coming up with novel drug treatment combinations for triple negative breast cancers based on gene expression. Cancer cell lines are initially sequenced and compared to normal tissue expression to determine what genes are being over expressed in the cancer. Drugs are then selected that can specifically combat the over expressed genes.

I grow and maintain the cells in the lab, prepare cell media, prepare cells for various experiments, and analyze the data of the sequenced gene expression using software called IPA.



Kyle McElyea

IU School of Medicine (Pathology)

Project: Immunohistochemical Analysis of Tumor Tissues in Cancer Diagnosis and Treatment

"Seeing the machines and software that chemists, biologists, and principal investigators regularly interact with solidifies the fact that BME is a perfect degree to use as a stepping stone to graduate research."

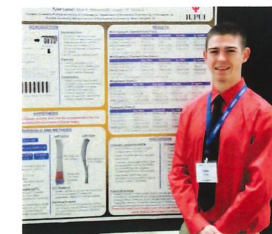


Nick Miller

IUPUI Physics & Biology

Investigating the Role of Chemotactic Sensing in Bacteriophage Predation

"My experience demonstrated the value of a multi-disciplinary approach to problem solving. Research fostered the development of relationships that I hope to maintain for the rest of my life."



Tyler Layne

IUPUI Biomedical Engineering

Project: Investigating the Effects of Exercise and Reduced Collagen Crosslinking on Bone

"I presented my research at the BMES National Meeting in San Antonio, TX. I was able to network with graduate schools and learn about the vast amount of research being done by biomedical engineers."

The Class of 2017



BME Award Recipients for 2017

3 Top 100 Awards:

Kyle McElyea, Landan Mintch, Lillie Wolter

Charles H. Turner Outstanding Achievement for Senior Year:
Brian Frondorf

Bepko Award for Outstanding Academic Achievement for the Junior Year:
Shozaf Zaidi

Bepko Award for Outstanding Academic Achievement for the Sophomore Year:
Alexis Lewandowski

Exemplary Internship or Research Award Recipient: **Tolulope Ajayi**

Biomedical Engineering Outstanding Service Award: **Trang Pham**

Outstanding Engineering Dual Degree BME Student Award: **Tyler Hudgens**

Bepko Continuing BME Student Scholarship: **Leah Meador**