Dear Friends of the UIC Richard and Loan Hill Department of Bioengineering,

For the past seven years we have published two newsletters, fall and spring, highlighting recent activities. These are archived on our website at “Newsletter” under the “About Us” and “News Center” links. This is our third annual report providing more detail on activities and accomplishments of our students and faculty over the past academic year, including this past summer (August 2017 – August 2018). Many metrics related to education and research are up this year, including undergraduate and graduate degrees conferred, as well as archival peer-reviewed journal publications and peer-reviewed external grants for both educational innovations and research projects. While we continue to expand enrollment in our undergraduate program in bioengineering and our graduate programs in bioengineering and bioinformatics, we are proud to announce the launch of a new undergraduate degree in bioinformatics this fall 2019, pending university approvals. This is in partnership with the Department of Computer Science at UIC.

As always, thank you for your support of our continued pursuit of excellence. Gifts targeted to the department continue to help us achieve our strategic goals and could include opportunities to endow a named professorship, scholarship, laboratory, or special facility or program. Recently, with your generous support to the department we have been able to increase the number of scholarships we can offer to deserving incoming undergraduates. For more information on giving, see “Make a Gift” under “About Us” on our website. In addition to financial support, I know that the network of UIC BioE alumni and friends will continue to help our students find internship and employment opportunities. Perhaps you would like to participate in our next Bioengineering Industry Day? (Learn about it inside.) I am always happy to meet our alumni and friends and welcome your visit. Please also join our Facebook group; see the link on the contents page.

Best wishes for a great new school year,

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Anjum Ansari, PhD
Dept/Company: Physics

Alexander Aronin, PhD
Dept/Company: Physical Therapy

Boaz Avital, MD, PhD
Dept/Company: Cardiac Electrophysiology

Amelie Bartholomew, MD, MPH, FACS
Dept/Company: Physiologic & Biostatistics

William Beck, PhD
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Anasarka Bedirian-Russo, PhD
Dept/Company: Dentistry

Tonya Berger-Wolf, PhD
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Dulal Bhauwila, PhD
Dept/Company: Epidemiology & Biostatistics

Alan Boghosian, DDS
Dept/Company: Northwestern University Dental School

Scott T. Braddy, PhD
Dept/Company: Anatomy and Cell Biology

Kenneth Brzinsky, PhD
Dept/Company: Mechanical & Industrial Engineering

Keija Cai, PhD
Dept/Company: Ophthalmology

Dingcai Cao, PhD
Dept/Company: Ophthalmology

David Carley, PhD
Dept/Company: Medicine

Sabri Celik, PhD
Dept/Company: Mechanical & Industrial Engineering

Michael Cho, PhD
Dept/Company: UT Arlington Bioengineering

Daniel Corcos, PhD
Dept/Company: Northwestern University Physical Therapy

Bhaskar Das Gupta, PhD
Dept/Company: Computer Science

Pieter de Tombe, PhD
Dept/Company: Loyola Physiology

John Daugirdas, PhD
Dept/Company: Medicine

Carmen DiGiovine, PhD
Dept/Company: 6 Degrees of Freedom, LLC

Ali Djallian, MD
Dept/Company: Ophthalmology

Xiaojing Du, PhD
Dept/Company: Pharmacology

Steven Duda, PhD
Dept/Company: Pulmonary, Critical Care, Sleep & Allergy

Carla Evans, DDS
Dept/Company: Orthodontics

Alan Feinerman, PhD
Dept/Company: Electrical & Computer Engineering

Douglas Feinstein, PhD
Dept/Company: Anesthesiology

Patricia Finn, PhD
Dept/Company: Physiology & Biophysics

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Ben Gerber, MD
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Dept/Company: Kinesiology

Oliver Graudjes, PhD
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Dept/Company: Computer & Computer Engineering

Stefan Green, PhD
Dept/Company: Research Resources Center

Ansi Gulati, PhD
Dept/Company: Midwestern University Pharmacy

Ogan Gurel, PhD
Dept/Company: Research Group

Nadim Hallab, PhD
Dept/Company: Rush University Medical Center Orthopedics

Luke Hanley, PhD
Dept/Company: Chemistry

Gleliz Hadman, MS
Dept/Company: Disability and Human Development

Daniel Hier, MD
Dept/Company: Neurology

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Dept/Company: Chemistry

Constance Jeffery, PhD
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Dept/Company: Pharmaceutical Biotechnology

Greg Jureich, PhD
Dept/Company: Bioengineering

Lan Kaufman, PhD
Dept/Company: General Sciences

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Dept/Company: Radiology/Northwestern University

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Dept/Company: Research Resource Services

Timothy Koh, PhD
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Fai Li, PhD
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Jianxun Li, PhD
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Dept/Company: Periodontics

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Dept/Company: UC Pediatrics

Olga Pal, PhD
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Avinash G. Patwardhan, PhD
Dept/Company: Northwestern Medicine

Dan Pavai, PhD
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David R. Pepperberg, PhD
Dept/Company: Ophthalmology

David Perkins, MD, PhD
Dept/Company: Medicine

Paul Pleskoff, PhD
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William Pietrzak, PhD
Dept/Company: Musculoskeletal Publication and Analysis, inc

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Robin Poust, PhD
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Josefa Rocha, PhD
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Kim Rilewicz, PhD
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Susanne Reiner
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Brian Roman, PhD
Dept/Company: University of Chicago Radiology

Patrick Roisman, PhD
Dept/Company: Enova Scientific Consulting

Charles Rhodes, PhD
Dept/Company: Physics

Mark Rosenblatt, MD, PhD
Dept/Company: Ophthalmology

Brenda Russell, PhD
Dept/Company: Physiology & Biophysics

Ashok Sabharwal, PhD
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Julian Schmied, PhD
Dept/Company: Kansas State University Chemical Engineering

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Dan Schonfeld, PhD
Dept/Company: Electrical & Computer Engineering

Joel Schwartz, DMD, DMSc
Dept/Company: Orthodontics

Stanley Scolve, PhD
Dept/Company: Information & Decision Sciences

Michael Scott, PhD
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Jason Williams, PhD
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Markus Wimmer, PhD
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Shailin Yang, PhD
Dept/Company: Psychiatry, Radiology

Nicolau Zago, PhD
Dept/Company: University of Chicago Radiology

Patrik S. Zipse, PhD
Dept/Company: Professor Emeritus
### 2017-2018 Annual Report

**Faculty Awards**

**Associate Professor in Bioengineering**

- **Salman Khetani** received the COE Advising Award and the University Housing Award for AY17-18. Dr. Khetani also received the COM Departmental Rising Star of the Year Award.

- **Tolou Shokuhfar** received both the COE Teaching Award and the Research Award for AY17-18.

- **Zhinan Wang, PhD**

  Dr. Zhinan Wang obtained his Ph.D. degree from UIC Bioengineering in 2017, focusing on cell imaging and laser microsurgery. He holds a Bachelor of Science in Electrical Engineering from Jilin University, China, and two Master of Science degrees in Electrical Engineering from Michigan Technological University and the University of Warwick, UK, focusing on laser and optics.

  “I’m excited to join the BIOE family as a new faculty member. As a bioengineer, I enjoy the environment of constantly searching, studying, creating and applying new ideas. At the same time, I feel the need and the fundamental responsibility of delivering knowledge to young researchers and college students. My current focus is on developing students’ ingenuity and initiative beyond the coursework in engineering education. I also work on applying new methods and techniques in technology-based instruction to help engineering students discover their potential and generate scholarly interests.”

- **Muge Karaman, PhD**

  Muge Karaman received her Ph.D. in Computational Sciences with a focus on functional magnetic resonance imaging (MRI) from Marquette University. She joined the Center for Magnetic Resonance Research (CMRR) at UIC in 2014 to perform her post-doctoral studies. There, she expanded her research in functional MRI to diffusion-weighted MRI. She is currently a research assistant professor at the Department of Bioengineering conducting her studies at the CMRR. The overall goal of her research is developing and validating quantitative diffusion-weighted MRI techniques for the characterization of complex biological tissue in vivo, and integrating these techniques into computational models to address current and future medical challenges. She is particularly interested in investigating their feasibility in probing the underlying tissue characteristics in different disease conditions and organs, including adult and pediatric brain tumors, gastric cancer, and breast cancer. These advanced MRI techniques aim to facilitate important clinical decisions in cancer diagnosis, early prediction of response to therapy, and monitoring disease recurrence, helping to develop optimized patient-management strategies.

- **Parijat Sengupta, PhD**

  Parijat Sengupta has joined UIC Bioengineering as a Research Assistant Professor. Research in her lab is focused on understanding the mechanisms altering neuronal network signaling in brain trauma and neurodegeneration using live cell imaging, electrophysiology and optogenetics. Dr. Sengupta has a MS in Chemistry from Indian Institute of Technology, Kanpur, and a PhD in Physical Chemistry and Biophysics from Tata Institute of Fundamental Research, Mumbai, India. Prior to joining UIC, she was a Research Assistant Professor at UIUC (Beckman Institute and Bioengineering), and the PI of the Opto-Neuro Technology lab. More about her research and a list of publications can be found at [publish.illinois.edu/psengupta](http://publish.illinois.edu/psengupta).

- **Associate Professor in Bioengineering**

  Tolou Shokuhfar received both the COE Teaching Award and the Research Award for AY17-18.

- **Richard and Loan Hill Professor Ian Papautsky**

  received the COM Departmental Faculty of the Year Award.

- **Associate Professor in Bioengineering**

  Richard and Loan Hill Professor Ian Papautsky and Professor James Patton were inducted into the College of Fellows of the American Institute for Medical and Biological Engineering (AIMBE) on April 9, 2018. Papautsky and Patton join the following UIC Bioengineering faculty already in the AIMBE College of Fellows: Professor & Head Thomas J. Royston, Richard and Loan Hill Professor of Engineering and University Distinguished Professor Michael Stroscio, Richard and Loan Hill Professor Jie Liang, University Distinguished Professor Richard L. Magin, Visiting Professor Urmila Diwekar and the following Affiliate and Emeritus Professors: Gyan Agarwal (ECE Emeritus), James Lin (ECE & BioE Emeritus), Yi-Chung Pai (Physical Therapy), and X. Joe Zhou (Radiology).
Xincheng Yao, PhD

Xincheng Yao received the University Scholar Award for 2018-2019. The University Scholars Program was created to honor and reward outstanding faculty members at the University of Illinois.

Miniaturized indirect ophthalmoscopy enables low-cost, non-mydriatic wide-field fundus photography

Xincheng Yao, PhD., Department of Bioengineering, UIC

Prompt screening and early diagnosis of eye diseases is essential to prevent visual impairment and blindness. Because many eye diseases, such as diabetic retinopathy (DR), retinopathy of prematurity (ROP), etc., can target retinal periphery, wide-field fundus photography is desirable for screening, diagnosis, and treatment evaluation. In order to explore affordable telemedicine of eye care, multiple portable or smartphone-based fundus cameras have been demonstrated, but existing commercially available portable fundus cameras have a limited field of view (FOV), typically < 45° external-angle (68° eye-angle), and frequently require pupillary dilation for examination of retinal periphery. The UIC Biomedical Optics and Functional Imaging Laboratory has recently demonstrated a novel design, i.e., miniaturized indirect ophthalmoscopy, to enable a low-cost, wide-field, smartphone fundus camera (Fig. 1). The lab-built smartphone fundus camera in Fig. 1 is totally wireless, with a whole weight of 255 g. This work has been featured as a ‘New Instruments’ article in RETINA, the journal of retinal and vitreous diseases (Retina 38, 438-441, 2018). By integrating near infrared guidance, the miniaturized indirect ophthalmoscopy enables non-mydriatic fundus camera with a snapshot FOV up to 67° external-angle (101° eye-angle) (Opt Lett 43, 2551-2554, 2018). For the proof-of-concept demonstration, the lab prototype fundus cameras were constructed using all off-the-shelf components. We anticipate that there is still significant room for further improvement of the FOV and image quality by professional optical design, promising a next-generation low-cost, non-mydriatic, wide-field fundus camera for affordable telemedicine and point-of-care assessment of eye diseases. This work has led to a patent application (US 62/546,830), and a commercialization plan is under development in collaboration with an industry partner.

To learn more about Dr. Yao’s lab, visit: yaolab.bioe.uic.edu

Student Awards

Graduate College Provost/Deiss Award

Wei Tian received the Provost/Deiss Award for Graduate Research for the project “Study of Protein Pockets and Application in Computational Drug Design and Discovery.” Wei Tian is with Dr. Jie Liang’s Molecular and Systems Computational Bioengineering Lab.

American Heart Association Predoctoral Fellowship

Yazan Abdel Majeed received the American Heart Associate Predoctoral Fellowship Award for his project “Effect of altering movement metrics identified by predictive models on stroke recovery outcomes.” Yazan is with Dr. James Patton’s Robotics Lab.

American Thoracic Society Conference Scholarship (ATS ‘18)

Ahmed Metwally received the American Thoracic Society Conference Scholarship. Ahmed is co-advised by Dr. Yang Dai and Dr. David Perkins.

PECTS Fellowship

Congratulations to the following six bioengineering PhD students who are recipients of the 2018-2019 NIH-funded UIC Center for Clinical and Translational Science (CCTS) Pre-doctoral Education for Clinical and Translational Scientists (PECTS) Fellowship. As PECTS trainees, they will be provided with a full graduate student stipend for one year beginning August 16, 2018. They will also receive trainee-related expense support of $1,000 per year for two years plus $1,000 for travel to professional meetings/conferences (totaling $3,000 over two years).

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Research Lab: Biomedical Optics and Functional Imaging Lab
Advisor: Dr. Xincheng Yao

Martina Guidetti
Research Lab: Acoustics and Vibrations Laboratory
Advisor: Dr. Thomas Royston

Mohammed Khan
Advisor: Dr. Asrar B. Malik

Daniel Kuang-Pu Lee
Research Lab: Biomedical Optics and Functional Imaging Lab
Advisors: Dr. Solomon Afelik & Dr. Jose Oberholzer

Yiming Lu
Research Lab: Biomedical Optics and Functional Imaging Lab
Advisor: Dr. Xincheng Yao

Michael Sun
Advisor: Dr. Mark I. Rosenblatt

Graduate College Provost/Deiss Award

Wei Tian received the Provost/Deiss Award for Graduate Research for the project “Study of Protein Pockets and Application in Computational Drug Design and Discovery.” Wei Tian is with Dr. Jie Liang’s Molecular and Systems Computational Bioengineering Lab.

American Heart Association Predoctoral Fellowship

Yazan Abdel Majeed received the American Heart Associate Predoctoral Fellowship Award for his project “Effect of altering movement metrics identified by predictive models on stroke recovery outcomes.” Yazan is with Dr. James Patton’s Robotics Lab.

American Thoracic Society Conference Scholarship (ATS ‘18)

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PECTS Fellowship

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Research Lab: Biomedical Optics and Functional Imaging Lab
Advisor: Dr. Xincheng Yao

Martina Guidetti
Research Lab: Acoustics and Vibrations Laboratory
Advisor: Dr. Thomas Royston

Mohammed Khan
Advisor: Dr. Asrar B. Malik

Daniel Kuang-Pu Lee
Research Lab: Biomedical Optics and Functional Imaging Lab
Advisors: Dr. Solomon Afelik & Dr. Jose Oberholzer

Yiming Lu
Research Lab: Biomedical Optics and Functional Imaging Lab
Advisor: Dr. Xincheng Yao

Michael Sun
Advisor: Dr. Mark I. Rosenblatt
Doctor of Philosophy in Bioengineering

Denis Michael Bergau
Machine Learning Prediction of Pre-Clinical Drug Induced QT Prolongation Liability and Pathway Analysis; Advisor: Hui Lu

Arghya Kamal Bishal
Functionalization of Biomaterials with Atomic Layer Deposition for Tunable Performance Enhancements; Advisor: Christoph Talukdar

Mahsa Ghaflari
Large-Scale Hemodynamic Analysis of Cerebral Arterial Tree with Parametric Mesh Generation Techniques; Advisor: Andreas Linninger

Ian Gopal Gould
Computational Mathematics elucidates the Dependence of Brain Perfusion on Microcirculation; Advisor: Andreas Linninger

Brian M. Henry
The Audible Human Project: Geometric and Acoustic Modeling in The Airways, Lungs and Torso; Advisor: Thomas Royston

George David Michael
Tribocorrosion Studies of Dental Materials, and the Clinical Implications; Advisor: Richard Magin

Michael A. Murtzchjan
Mechanical Inputs to Cardiac Fibroblasts and Myocytes Affect Structure, Function, and Signaling Response; Advisor: Brenda Russell

Maziyar Movahedtalab Khansari
Quantitative Analysis of Ocular Microcirculation Images in Human Health and Disease; Advisor: Mahnaz Shahidi

Andre Paredes
Effects of Variable Energy Delivery on Luteocystic Kinetica and Wound Healing; Advisor: Amelia Bartholomew

Paras Salleh Parikh
MRI-based Curvature Assessment and High-Resolution TI Mapping to Detect Cardiac Structural Abnormalities; Advisor: Jason Ng, Thomas Royston

Shresta Patangay
Pattern Electrolethromagnetics in Peripheral Retina: System Development and Validation in Human Subjects; Advisor: John Hetling

Megan Lynn Reclus
Engineered Systems for Controlled Hypoxia and Thermogenesis; Advisor: David Eddington

Vidyani Suryadewara
Role of Phospholipase D in Isotropic Pulmonary Fibrosis and FIBR Imaging to Detect Flbrogenesis; Advisor: Viswanathan Natarajan, Thomas Royston

Benquan Wang
Functional Optical Coherent Tomography of Stimulus-Induced Intrinsic Optical Signals in the Retina; Advisor: Xincheng Yao

Yuan Xing
Microfluidic Platform for In Vitro Study on the Development of Cell Therapy; Advisor: Jose Oberholzer

Doctor of Philosophy in Bioinformatics

Peter E. Larsen
Modeling Host-Microbiome Interaction; Advisor: Yang Dai

Cong Liu
Investigation of Feature Selection Methods in High-Throughput Omics Data Analysis; Advisor: Hui Lu

Ahmed Mohamed Ibrahim Metwally
Computational Methods for Longitudinal Microcirculation Image Analysis, Identification, Modeling, and Classification; Advisor: David Perkins, Yang Dai

Wenyi Qin
Novel Statistical Methods Through Data Integration for Disease-related Gene and Pathway Dectectioin; Advisor: Hui Lu

Master of Science in Bioengineering (thesis)

Mounica Bandela
Role of Lymphovascular Acryl Transferase in Lung Epithelial Cell Apoptosis; Advisor: Viswanathan Natarajan

Martina Berni
Haptic Surgical Guidance for Prostate Biopsy; Advisor: Cristian Luciano

Elena Boselli
EOChiMA: ElectroChemical Sensors for Heavy Metal Analysis in Point of Care Applications; Advisor: Ian Papautsky

Brandon M. Caldwell
Correlating Histopathology and Radiologic Imaging to Validate Prostate Cancer Detection; Advisor: Richard Magin

Tommaso Carella
Computational Method for Network Passive Software Robotic Devices; Advisor: James Patton

Leonardo Crespi
Virtual Reality and Haptic Training Simulator for Sacral Neuromodulation Surgery; Advisor: Cristian Luciano

Giaccomo D’Alessandro
Design, Fabrication, Texting of an Optical Sensor to Measure Effective Retinal Cone Bumance in Situ; Advisor: John Hetling

Eleonora D’Armese
Automating Lung Cancer Indentification in PET/CT Imaging; Advisor: Tanja Berger-Wolf

Matteo De Silvestri
Real-Time Haptic Guidance System for Retinal Surgery Based on Intravoxel Optical Coherence Tomography; Advisor: Cristian Luciano

Erika Ferrari
Optimized Protein Patterning Methods for Human Liver Cultures; Advisor: Salman Khatri

Gigliola Gandini
Porcine Lung Acoustics: Simulating Airway Insonification and Magnetic Resonance Elastography; Advisor: Thomas Royston

Chiara Gatti
Murine Lung Acoustics: Simulating Airway Insonification and Magnetic Resonance Elastography; Advisor: Thomas Royston

Luca Izzo
Influence of Static Magnetic Field on Cell Viability in a Miniaturized Optically Accessible Bioreactor; Advisor: Tolou Shokuhfar

Foram B. Kamdar
Electrophysiological Assessment of Internal Noise in the Human Visual Pathway; Advisor: J. Jason McAnany

Federico Nebuloni
Inertial Focusing of Cells Nuclei in Straight Microchannels; Advisor: Ian Papautsky

Greta Pastore
Tongue Position Tracking Device (TPTD): A Discrret Wireless Electropalatography and Glossometry Device; Advisor: Hananeh Esmailbeigi

Eleonora Pensa
Enhanced Properties of Polyimyl Methacrylate Coated with Atomic Layer Deposited Ceramic Nanofilm; Advisor: Christos Takoudis

Giacomo Piccinni
Tongue-To-Speech (TTS): Wearable Wireless Assistive Device for Augmented Speech; Advisor: Hananeh Esmailbeigi

Fabio Pradella
A Novel Serum-Free Medium Formulation for Human Liver Cultures with Applications in Drug Screening; Advisor: Salman Khatri

Abhay V. Sane
Cellular Obstruction Clearance Of Proximal Ventricular Catheters Using Low-Voltage Joule Heating; Advisor: Andreas Linninger

Loudmila V. Sorkina
Extracellular Matrix Effects on Hepatocyte Functioning: A Multivariate Regression Approach; Advisor: Salman Khatri

Marco Zampini
0.5T Benchtop Magnet: Development of a MR Elastography Setup and Tissue Samples Characterization; Advisor: Deiter Wall

Master of Science in Bioengineering (non-thesis)

Nikita Anil Angane
Novel Statistical Methods Through Data Integration for Disease-related Gene and Pathway Dectectioin; Advisor: Hui Lu

Farrukh Mukhtar
Nikita R. Pisa
Erika R. Pursell
Patinat Sanitplik
Shayan Shafee Nazhad
Abishakmaurya Srikantmaurya
Stephanie Varga Tolbert
Wen Wen
Giong Wu
Mathew D. Yang
Fan Zhu

2017-2018 Annual Report
### Graduates 2017-2018

**Bachelor of Science in Bioengineering**

- Feba A. Abraham
- Umur Acar
- Najah S. Ahsan
- Zahra S. Ahsan
- Christopher R. Alcantar
- Bekah E. Allen
- Darius Steven ansari
- Melissa Cristina Aranda
- Ricardo Aranda
- Mujahid M. Arozullah
- Emil E. Basora
- Ernesto Barrum
- Adrian Omama Bico
- Pawel Rafał Bujakowski
- Sebastian K. Chiosta
- Jerzy W. Cholewa
- Maciej Ciurej
- Rohan B. Damnala

- Yandi C. Farimango
- Jodi K. Finlay
- Clarissa A. Flores
- Najah S. Ahsan
- Nicholas Rembuktat Garcia
- Becker Gholah
- Michael Anthony Godoy
- Nicholas John Green
- Alexander Grycuk
- Ayman Elsayed Hassanein
- Donovan A. Hoffman
- Justas Jakobonis
- Natalie Josephine Jaydos
- Hatifya Dula Jimjimo
- Kevin Michael Kerr
- Saad A. Khan
- Shan Mohammad Khan

- Stanly Mathew
- Ali Mehmood
- Bruno A. Munoz Cardiel
- Jasm Ahmad Naeem
- Omar Nour El-Din
- Meagan Ouy
- Kishore K. Palla
- Junaid Syed Pirzada
- Luke N. Prieto
- Vijay T. Puthiricakal
- David Samuel Resnick
- Jaqueline O. Rojas Robles
- Naif A. Saad
- Shovik Sarkar
- Samuel Arthur Schmakel
- Alyj Segura
- Alden M. Shoup
- Meraj J. Siddiqui

- Joshua P. Smejkal
- Shana Taral Snarrenberg
- Cassandra Michelle Steffey
- Abhinav A. Subramanian
- Parnami Nadi Samadhi Swenson
- Adeline Vessellnova Voukadinova
- Michael Richard Wells
- Kristin M. Wiseman
- Aliya Yasmin
- Kevin Jiawen Zeng

### Student Enrollment

#### Degrees Awarded (2009 - 2018)

<table>
<thead>
<tr>
<th>Year</th>
<th>PHD</th>
<th>MS</th>
<th>BS</th>
</tr>
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<tbody>
<tr>
<td>2009-10</td>
<td>18</td>
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<td>2011-12</td>
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<td>2015-16</td>
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<td>12</td>
</tr>
<tr>
<td>2016-17</td>
<td>19</td>
<td>23</td>
<td>33</td>
</tr>
</tbody>
</table>

#### Total Population Comparison (Fall 2009 & Fall 2018)

- **PHD**: 2009: 33, 2018: 64
- **MS**: 2009: 36, 2018: 52
- **BS**: 2009: 186, 2018: 304
Congratulations to the EMBS UIC Student Branch
EMBS Best New Student Chapter or Club for 2018

2017-18 Active Bioengineering Organizations

Alpha Eta Mu Beta
Biomedical Engineering Honor Society
aemb-uic.weebly.com

Bioengineering Graduate Society
bgs.org.uic.edu

Biomedical Engineering Society
uic-bmes.weebly.com

Engineering World Health
ewhuic.wordpress.com

Society of Women Engineers
swe.engr.uic.edu

IEEE Engineering in Medicine and Biology Society
embs-uic.weebly.com

UIC Bioengineering Student Journal
bioe.uic.edu/ubsj

Learn more about our student organizations at:
bioe.uic.edu

Bioengineering Industry Day

DATE & TIME
Friday, November 2
Please arrive by 1:30pm
2:00pm-3:30pm: Roundtable Discussions
3:30pm-4:30pm: Networking
4:30pm: Closing

LOCATION
Student Center East, Room 605
750 S Halsted St, Chicago, IL

REGISTRATION & DETAILS
Eliana Riley: eliana@uic.edu

Join us on Friday, November 2 for the fifth annual UIC Bioengineering Industry Day! Connect with UIC bioengineering alumni, faculty, and partners working in industry. This is a great opportunity to see fellow UIC alumni and former professors while providing advice and guidance to aspiring bioengineering students.

The primary goal of Bioengineering Industry Day is to engage with current UIC bioengineering students in brief discussions about how you made the transition from college to a career in bioengineering. This is an informal and informational event. You do not have to prepare any materials or presentations. Mostly, be ready to mingle and talk about how you got to where you are today!

If you have any questions about the UIC Bioengineering Industry Day, please contact Michelle (Johnson) Mittelman, Associate Director, UIC Engineering Career Center, at mittel@uic.edu.

Employers will be from areas including: bioinformatics, biomaterials, biomechanics, rehabilitation, bioinstrumentation, implants

Companies that participated in Prior Industry Days:

- Abbott
- Abbvie
- Baxter
- Corporate Law Partners
- Exponent
- FILTRAN
- Fresenius Kabi
- FDA
- GE
- Hollister
- Hospira
- I3Bio
- Illinois United Biotechnology Industry Organization
- NOVOSURGICAL
- Pfizer
- Spherotech
Seminar Series 2017-2018

Fall 2017

• Development of Bioreabsorbable Magnesium Implants: Hydrogen Sensors
  William R. Heineman, PhD
  Distinguished Research Professor, Department of Chemistry
  University of Cincinnati

• Engineered Titanium Dioxide Nanotube Based Sensing Platform for Low Cost
  Biomedical Diagnostics in Resource Limited Settings
  Swomitrita Mohanty, PhD
  Assistant Professor, Department of Chemical Engineering
  University of Utah

• Leverage Cancer Prevention and Control with Quantitative Data Science
  Cheng Zhu, PhD
  Regents’ Professor of Biomedical Engineering, Mechanical Engineering
  and Physics and J. E. User’s Professor of Chemical Engineering
  Georgia Institute of Technology

• Polymeric Nanoparticles: Tumor Microenvironment and Implications for New
  Nanoparticle Design and Development
  Omid Farokhzad, MD
  Professor, Anesthesiology
  Harvard Medical School

• Physical Remodeling of the Local Matrix during Mesenchymal Cell Migration and
  Endothelial Network Assembly
  Brendon Baker, PhD
  Assistant Professor, Department of Biomedical Engineering
  University of Michigan

• The Mixed Effect of Age and Gender in Rehabilitation Medicine
  Youn Dhafer, PhD
  Director of the Sawtell Center for the Science of Walking
  University of Illinois at Urbana-Champaign

• Translational Immunoenengineering Biosensors for Personalized Disease Theranostics at
  Point-of-Care
  Umer Hassan, PhD
  Research Scientist, Department of Bioengineering
  University of Illinois Urbana-Champaign

• Controlling and Observing the Kinetics of Dynamic Processes in Liquids Using STEM
  Nigel D. Brown, PhD
  Professor, School of Engineering & School of Physical Sciences
  University of Liverpool

• Applications of High-Throughput Cell Microenvironment Engineering
  Gregory H. Underhill, PhD
  Assistant Professor, Department of Bioengineering
  University of Illinois Urbana-Champaign

• New Biomaterial Platforms for 3D Printing and Their Promise in Medicine
  Ramile Shah, PhD
  Assistant Professor of Materials Science and Engineering,
  Surgery (Transplant Division), and Biomedical Engineering
  Northwestern University

• Targeting Mechanobiological Mediators of Fibrosis
  Daniel J. Tschumperlin, PhD
  Associate Professor
  Vice Chair, Department of Physiology & Biomedical Engineering
  Mayo Clinic College of Medicine

• Spatial-temporal modeling of mechanochemistry of cellular processes
  Jian Liu, PhD
  Investigator
  National Heart, Lung, and Blood Institute

• The Extracellular Matrix as an Inductive Signal for Apoptotic Bcl-2 Family Proteins
  Shinghua Ding, PhD
  Professor
  Department of Biochemistry & Molecular Biology
  University of Cincinnati

• Beyond Modularity: Towards a Network Biology Axis of Wellness and Disease
  Prevention.
  Simon Kasif, PhD
  Professor of Biomedical Engineering, Computer Science and
  Biocomputingics
  Boston University

• How do enzymes really catalyze chemistry so magnificently efficiently?
  Steven D. Schwartz, PhD
  Professor, Department of Chemistry and Biochemistry &
  Department of Applied Mathematics
  University of Arizona

• NAMPT is essential for neuronal protection, motor function and survival
  Xinan Holly Yang, PhD
  Professor, Department of Pediatrics
  University of Missouri - Columbia

• Computational discovery of gene regulatory network in complex disease through Long
  Non-Coding RNAs
  Anne Marion Taylor, PhD
  Institute for Developmental Disabilities
  University of North Carolina Neuroscience Center & Carolina
  Institute for Developmental Disabilities

• Integrated Neuro-Circuits and Signal Processing: a human clinical case study of a novel
  recording and stimulation system on a chip
  Zhi Yang, PhD
  Research Assistant Professor, Department of Pediatrics
  University of Missouri - Columbia

• Microfluidic Tools for Spatiotemporal Analyses in Living Tissue
  Rebecca P. Pompano, PhD
  Assistant Professor, Department of Chemistry
  University of Virginia

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  University of Virginia

Spring 2018

• Hidden Factors at Nanobiointerfaces
  Morteza Mahmoudi, PhD
  Instructor, Department of Anesthesiology
  Brigham and Women’s Hospital/ Harvard Medical School

• Designing selective peptide inhibitors of anti-apoptotic Bcl-2 family proteins
  Amy E. Keating, PhD
  Professor of Biophysics and Biocomputingics
  Massachusetts Institute of Technology

• The Extracellular Matrix as a Inductive Template for Functional Tissue
  Stephen Badyak, DVM, PhD, MD
  Professor of Surgery
  Deputy Director, McGowan Institute for Regenerative Medicine
  McGowan Center for Preclinical Studies
  University of Pittsburgh

• A programmable microfluidic processor for biomolecule detection, organ chips, and space
  exploration
  Jungkyu (Jay) Kim, Ph.D
  Assistant Professor, Dept. of Mechanical Engineering
  Adjunct Professor, School of Medicine
  Texas Tech University

• Investigating Injury-induced Synaptic Remodeling using Microfluidic Devices
  Anne Marion Taylor, PhD
  Assistant Professor
  Biomedical Engineering
  University of North Carolina Neuroscience Center & Carolina
  Institute for Developmental Disabilities

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  University of Virginia
### Research Funding

#### National Science Foundation (NSF)

<table>
<thead>
<tr>
<th>PI &amp; Co-Is in the Dept</th>
<th>TITLE OF PROJECT</th>
<th>PERIOD</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salman Kheteran, David Wood</td>
<td>Collaborative Research: High-throughput microcoid platform for drug toxicity screening</td>
<td>9/2017-8/2020</td>
<td>$300,000</td>
</tr>
<tr>
<td>Andreas Linnenger</td>
<td>NSRE REU Supplement Program</td>
<td>2017-2018</td>
<td>$14,000</td>
</tr>
<tr>
<td>Jie Liang</td>
<td>CBET: Computational Platform for Predictive Magneto-hydrodynamie drug targeting</td>
<td>2017-2020</td>
<td>$297,955</td>
</tr>
<tr>
<td>Andreas Linnenger</td>
<td>A vascular tree topology inspired platform to compute intracranial blood flow (tree CFD)</td>
<td>8/2017-7/2020</td>
<td>$420,000</td>
</tr>
<tr>
<td>Ac Ma</td>
<td>Conformational dynamic reaction coordinates, and time scale equilibration biomolecular systems from the perspective of energy flows</td>
<td>8/2017-7/2020</td>
<td>$465,000</td>
</tr>
<tr>
<td>Ian Papautsky</td>
<td>Center for Advanced Design and Manufacturing of Integrated Microfluidics</td>
<td>12/2016-2/2019</td>
<td>$138,000</td>
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<tr>
<td>Ian Papautsky</td>
<td>Electrochemical Methods for Improving Metal Extraction</td>
<td>6/2017-11/2018</td>
<td>$50,000</td>
</tr>
<tr>
<td>Ian Papautsky</td>
<td>Center for Advanced Design and Manufacturing of Integrated Microfluidics – REU Supplemental</td>
<td>3/2018-2019</td>
<td>$9,000</td>
</tr>
<tr>
<td>Ian Papautsky</td>
<td>Y5-006: Electrochemical Sensors for Plant Nutrition</td>
<td>3/18-2/19</td>
<td>$38,000</td>
</tr>
<tr>
<td>Ian Papautsky</td>
<td>Y5-006: Microfluidic Chips for Electrochemical Metal Extraction</td>
<td>3/18-2/19</td>
<td>$45,000</td>
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<tr>
<td>Tolou Shokuhfar</td>
<td>CAREER: A New Perspective on Bionanomaterialization in Healthy and Dysfunctional Fertilite</td>
<td>9/2014-2016</td>
<td>$430,000</td>
</tr>
<tr>
<td>Tolou Shokuhfar, Reza Shahbaziyan Yasser</td>
<td>Fundamental Understanding of Growth and Inhibition of Calcium Oxalate Kidney Stones</td>
<td>8/2017-7/2020</td>
<td>$390,000</td>
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<tr>
<td>Tolou Shokuhfar</td>
<td>MTRI Acquisition of an Inductively Coupled Plasma Mass Spectrometer for Metal Analysis in Environmental Media</td>
<td>9/2017-2018</td>
<td>$209,947</td>
</tr>
<tr>
<td>Tolou Shokuhfar</td>
<td>EAGER: “Touch and KFI”. A New Mechanism for Engineered Nanomaterials to Fight Bacteria</td>
<td>1/2018-2019</td>
<td>$220,000</td>
</tr>
<tr>
<td>Tolou Shokuhfar, Constantine Megaridis, Susanh Amin</td>
<td>A bottom-up framework for the nanoscale origins of ice formation and adhesion on structured surfaces</td>
<td>7/2018-6/2021</td>
<td>$118,144</td>
</tr>
<tr>
<td>David Stone, Jie Liang</td>
<td>MCB: Empirical and mathematical approaches to study gradient sensing using yeast as a model</td>
<td>9/2014-4/2018</td>
<td>$204,109</td>
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<tr>
<td>David Stone, Jie Liang</td>
<td>Workshops: Finding your inner modeler: how computational biology can advance your research and how to get started</td>
<td>6/2017-7/2018</td>
<td>$95,000</td>
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<tr>
<td>Chrisios Takoudis Kilo, Salih Khejinj, Cabana, Yasser</td>
<td>MTRI: Acquisition of a Dual-EELS Gatan Quantum Imaging Spectrometer to Upgrade the JEOIL ARM-200CF at UIC</td>
<td>6/2016-5/2018</td>
<td>$597,603</td>
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#### National Institutes of Health (NIH)

<table>
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<tr>
<th>PI &amp; Co-Is in the Dept</th>
<th>TITLE OF PROJECT</th>
<th>PERIOD</th>
<th>AMOUNT</th>
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</thead>
<tbody>
<tr>
<td>David Edington</td>
<td>3D Printed High Throughput Microfluidic Platform to Generate Microenvironmental Oxygen And Hydrogen Sulfide Landscapes</td>
<td>5/2018-4/2020</td>
<td>$17,858</td>
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<tr>
<td>David Edington</td>
<td>Cholesterol Regulation of Endothelial K+ Channels</td>
<td>4/2014-3/2018</td>
<td>$1,709,390</td>
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<tr>
<td>Patricia Feng</td>
<td>Precision Medicine in Sarcomiosis</td>
<td>4/2018-3/2022</td>
<td>$271,189</td>
</tr>
<tr>
<td>Amy Kenter, Jie Liang</td>
<td>Deciphering high resolution ligand chomatography implications and impacts on Ig repertoire.</td>
<td>4/2018-3/2020</td>
<td>$40,546</td>
</tr>
<tr>
<td>Jie Liang, Gregory Underhill</td>
<td>Elucidating chemo-mechanical determinants of human hepatocyte and stellate cell responses in non-alcoholic fatty liver disease</td>
<td>2/2018 - 1/2022</td>
<td>$690,167</td>
</tr>
<tr>
<td>Mari Kotche, John Heilig, Thomas Rioslyon</td>
<td>Bioengineering Summer Research Experience for High School Teachers</td>
<td>1/2016-12/2020</td>
<td>$539,177</td>
</tr>
<tr>
<td>James Lee, Grace Sun</td>
<td>Cytosolic Phosphatase A2 in Amyloid-Beta Peptide-Stimulated Central Endothelium</td>
<td>5/2014 - 4/2019</td>
<td>$1,538,304</td>
</tr>
<tr>
<td>Jie Liang, Yan-Yan Tseng</td>
<td>Database and Tools for Functional Inference and Mechanical Insight into Somatic Carcinogenesis</td>
<td>4/2017-3/2020</td>
<td>$1,064,054</td>
</tr>
<tr>
<td>Amy Kenter</td>
<td>Constructing Ensembles of 3D Structures of Igh Loci and Predicting Novel Chromosomal Interactions</td>
<td>7/2017 - 6/2019</td>
<td>$420,546</td>
</tr>
<tr>
<td>Andreas Linnenger, A-Alian</td>
<td>NINDS: A vascular tree topology inspired platform to compute intracranial blood flow (tree CFD)</td>
<td>2017-2019</td>
<td>$420,594</td>
</tr>
<tr>
<td>Natalia Nieto, Dilara Kost</td>
<td>Pathogenic Role of Signature High Mobility Group Box-1 Isolorms as Potential Therapeutic Targets to Prevent and/or to Resolve Liver Fibrosis</td>
<td>7/2017-6/2021</td>
<td>$2,015,754</td>
</tr>
<tr>
<td>Ian Papautsky</td>
<td>Development of a lab on chip for point of care biomonitoring of blood metals</td>
<td>1/2017-5/2019</td>
<td>$676,010</td>
</tr>
<tr>
<td>Ian Papautsky</td>
<td>Validation and Demonstration Of Point Of Care Sensor For Multi Metal Exposure Assessment</td>
<td>1/2017-6/2018</td>
<td>$339,047</td>
</tr>
<tr>
<td>James Patton, FC Huang</td>
<td>Error-enhanced learning &amp; recovery in 2 &amp; 3 dimensions</td>
<td>7/2013 - 6/2018</td>
<td>$1,574,700</td>
</tr>
<tr>
<td>David Perkins, Patricia Finn, Ying Dai, FC Huang</td>
<td>The microbiota and allograft rejection: Novel investigations into the consequences of obesity</td>
<td>7/2017-6/2018</td>
<td>$133,249</td>
</tr>
<tr>
<td>Thomas Rioslyon, Dilara Kost, Richard Magin</td>
<td>Noninvasive tools for assessing muscle structure and function (Subcontract through NLI PI: Peraeel)</td>
<td>9/2018-6/2021</td>
<td>$833,489</td>
</tr>
<tr>
<td>Thomas Rioslyon, Robert Malanick</td>
<td>Early Warning for the Onset of Acute Chest Syndrome in Sickle Cell Patients</td>
<td>11/2017 - 11/2018</td>
<td>$30,000</td>
</tr>
<tr>
<td>William Townsend, James Patton</td>
<td>Bimanual Robotic Rehabilitation System with Variable Interaction</td>
<td>7/2017 - 6/2018</td>
<td>$72,865</td>
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</tbody>
</table>
# Research Funding

## NIH Continued

<table>
<thead>
<tr>
<th>PI &amp; Co-I’s in the Dept</th>
<th>TITLE OF PROJECT</th>
<th>PERIOD</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xincheng Yao</td>
<td>Super-Resolution Ophthalmoscopy for in Vivo Retinal Imaging</td>
<td>9/2014-8/2018</td>
<td>$1,034,350</td>
</tr>
<tr>
<td>Xincheng Yao &amp; Mark Rosenblatt</td>
<td>Instrument shop core</td>
<td>9/2015-3/2019</td>
<td>$300,950</td>
</tr>
<tr>
<td>Xincheng Yao &amp; Lei Liu</td>
<td>Development and Validation of a Holographic Waveguide-Based Disclometer for Objective and Comprehensive Disclometer Disorder Assessment</td>
<td>9/2016-8/2018</td>
<td>$427,898</td>
</tr>
<tr>
<td>Jinfeng Zhang &amp; Jie Liang</td>
<td>Collaborative research: Mathematical frameworks for biomolecules: from proteins to RNAs to Chromosomes</td>
<td>7/2017-6/2022</td>
<td>$1,549,997</td>
</tr>
</tbody>
</table>

## Other Agencies and Industry

<table>
<thead>
<tr>
<th>PI &amp; Co-I’s in the Dept</th>
<th>TITLE OF PROJECT</th>
<th>PERIOD</th>
<th>FUNDING AGENCY</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Megha Agrawal</td>
<td>New Approaches to Battle Neurodegenerative Disorders</td>
<td>2/2016-2/2019</td>
<td>USA Prime Business, LLC</td>
<td>$450,000</td>
</tr>
<tr>
<td>Mitra Dutta &amp; Michael Stroscio</td>
<td>Improving the Understanding of Heat and Carrier Transport in Electronic Heterostructure Devices by Proper Treatment of Boundary Effects in Wide Bandgap Structures including AlGaN</td>
<td>8/2016-7/2019</td>
<td>AFOSR</td>
<td>$500,000</td>
</tr>
<tr>
<td>Davide Emmolo &amp; Michael Stroscio &amp; others</td>
<td>Three Birds with One Stone: High-Frequency Instrumentation for Semiconductor Device, Radar and Communication System Measurements</td>
<td>2016-2019</td>
<td>DoD</td>
<td>$600,000</td>
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<td>Hananeh Esmaeilbeigi</td>
<td>Tongue Computer Interface</td>
<td>4/2017-12/2017</td>
<td>Ventuswell</td>
<td>$5000</td>
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<td>Salman Khetani</td>
<td>High Content Screening System for Multicellular System</td>
<td>3/2018-2/2019</td>
<td>University of California at Irvine</td>
<td>$31,146</td>
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<tr>
<td>Miki Koche</td>
<td>Translation of user needs into engineering design requirements for medical devices</td>
<td>1/2018-6/2018</td>
<td>Fullsight</td>
<td>$34,674</td>
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<tr>
<td>James Patton</td>
<td>Machines Assisting Recovery From Stroke And Spinal Cord Injury For Reintegration Into Society</td>
<td>10/2012-9/2018</td>
<td>NIDRR</td>
<td>$5,700,000</td>
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<td>James Patton &amp; David Reinkensmeyer</td>
<td>Collaborative Machines Enhancing Therapies (COMET)</td>
<td>9/2018-9/2023</td>
<td>NIDILRR</td>
<td>$924,952</td>
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<td>Thomas Royaton</td>
<td>Nanopositioning instrumentation development for the Advanced Photon Source</td>
<td>2009-ongoing</td>
<td>DOE - ANL</td>
<td>$500,000</td>
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<tr>
<td>Tolou Shokuhfar</td>
<td>Direct Observation of Fiber Fluid Hygrophobic Interactions with LiquidCellTEM</td>
<td>9/2015-8/2017</td>
<td>The Nanowave Institute</td>
<td>$79,513</td>
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<tr>
<td>Tolou Shokuhfar &amp; Emre Firat</td>
<td>Observation of Bacterialization Dynamics in Magnetoelastic Bacteria Via in Situ Transmission Electron Microscopy</td>
<td>6/2016-11/2017</td>
<td>Chicago Biomedical Consortium</td>
<td>$15,000</td>
</tr>
</tbody>
</table>


Droge, W., "Oxidative Stress, Oxidative Stress in Health and Disease" (Springer, 2006)


Duda N., "Preva...
73. Lu Y, Wang, B., Pepperberg, D. R., & Yao, X. (2017). Stimulus-evoked outer segment changes occur before the hyperpolarization of *Corresponding author


The UIC Department of Bioengineering, established in 1965, houses one of the oldest bioengineering/biomedical engineering programs in the country, third to be ABET accredited for its undergraduate biomedical engineering program.

UIC is the largest institution of higher learning in the Chicago area and is one of the most diverse research-intensive universities in the nation.

The University of Illinois at Chicago (UIC) was recently ranked #23 in the nation among public research universities.

There are no majority racial or ethnic groups at UIC. The most recent U.S. News & World Report review of colleges ranks UIC #9 out of 311 Carnegie-classified national universities for campus ethnic diversity.

Questions?

Email: Miiri Kotche, Ph.D, mkotch2@uic.edu

Did you know?

The Richard and Loan Hill Department of Bioengineering offers a once in a lifetime internship opportunity to our undergraduate students. The Clinical Immersion Program is a six-week internship designed to provide intensive exposure to the clinical environment in order to conduct human-centered research focusing on observation and needs assessments. Small groups of students rotate every three weeks through two hospital clinics. Each team is provided a clinical mentor in each rotation. This program, in preparation for the Interdisciplinary Medical Product Development class, allows students to identify real needs as they shadow medical personnel in a UIC clinical environment. Through collaborations with doctors at the UIC hospital, students will witness medical procedures, investigate the philosophy of approach by the practitioners, participate in problem-solving sessions, and identify problems or difficulties that can potentially serve as a future opportunity for improvement through bioengineering design. The success of the program lies in exposing students to the entire medical product development cycle, beginning in the earliest stages of needs assessment. This new program is another commitment by the Department of Bioengineering to help students gain experience outside the typical classroom.

-Sarita Deshpande

Past Participant

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-Sarita Deshpande

Read more on the Clinical Immersion website: clinicalimmersion.uic.edu