

---

---

## PATRICIA SARA ARAUZ SOUCY

**Associate Professor**  
**Department of Bioengineering**  
**J.B. Speed School of Engineering**  
**University of Louisville**

2210 S. Brook St.  
Shumaker Research Building #356  
Louisville, KY 40208  
Office: 502-852-8321  
Fax: 502-852-6806

[tricia.soucy@louisville.edu](mailto:tricia.soucy@louisville.edu)

<http://louisville.edu/speed/people/faculty/soucyPatricia>

---

---

### EDUCATION

- 2003- 2010    **Ph.D., Biomedical Engineering**, Johns Hopkins University, Baltimore, MD.  
Dissertation: “Fibroblast-derived Extracellular Matrix Directs Endothelial Tubulogenesis.”
- 1999-2003    **B.S., Biomedical Engineering, Minor in Mathematics**, Magna Cum Laude,  
Saint Louis University, St. Louis, MO.  
Sr. Project: “Collagen-Hydroxyapatite-Poly (ethylene glycol) Composite Hydrogels for Orthopedic Applications”

### EXPERIENCE

- 2021-present    Associate Professor (Term), Dept. of Bioengineering, University of Louisville,  
Louisville, KY.
- 2019-2021    Assistant Professor (Term), Dept. of Bioengineering, University of Louisville,  
Louisville, KY.
- 2013-2019    Assistant Professor (Tenure Stream), Dept. of Bioengineering, University of  
Louisville, Louisville, KY.
- 1/2013-6/2013    Assistant Professor (Term), Dept. of Bioengineering, University of Louisville,  
Louisville, KY.
- 2010-2012    Postdoctoral Associate, Dept. of Bioengineering, University of Louisville,  
Louisville, KY.
- 3/2010-9/2010    Postdoctoral Fellow, Dept. of Anesthesiology and Critical Care Medicine, Johns  
Hopkins University, Baltimore, MD.
- 2003-2010    Doctoral Student, Dept. of Biomedical Engineering, Johns Hopkins University,  
Baltimore, MD.
- 2001-2003    Undergraduate Researcher, Dept. of Biomedical Engineering, Saint Louis  
University, St. Louis, MO.

## HONORS AND RECOGNITION

- Student Champion: University of Louisville (2021, 2022)
- Faculty Favorite: University of Louisville, Delphi Center for Teaching and Learning (2014, 2016, 2018, 2019, 2021).
- Innovation and Career Development Travel Award, Biomedical Engineering Society, Seattle, WA (2013)
- Ruth L. Kirschstein National Research Service Award, Individual Predoctoral Fellowship (2006 - 2009)
- Carl Storm Underrepresented Minority Fellowship for Gordon Conference on Signal Transduction by Engineered Extracellular Matrices (2008)
- Undergraduate Competition 1st Place Award, American Society of Mechanical Engineers (2003)
- Oliver L Parks Award, Saint Louis University (2003)
- Outstanding Biomedical Engineering Senior Award, Saint Louis University (2003)
- Undergraduate Research Award, Biomedical Engineering Society (2002)
- Undergraduate Presentation Award, Society for Advancement of Chicanos and Native Americans in Science (2002)

## RESEARCH AND CREATIVE ACTIVITY

### Summary of Impact Factors for Peer-Reviewed Journal Publications:

<u>Journal</u>	<u>Topic</u>	<u>Impact Factor</u>	<u># of Articles</u>
<i>Lab on Chip</i>	Micro/ Nanoscale Devices	7.517	1
<i>Matrix Biology</i>	Extracellular Matrix	6.986	1
<i>Acta Biomaterialia</i>	Biomaterials Science	6.319	2
<i>Biomacromolecules</i>	Polymer & Biological Sciences	5.667	2
<i>RSC Advances</i>	Chemistry	3.049	1
<i>PloS one</i>	Medical Sciences	2.776	1
<i>Radiation &amp; Environmental Biophysics</i>	Radiation Research & Biophysics	1.582	1
<b>TOTAL PEER-REVIEWED JOURNAL ARTICLES</b>			<b>9</b>

### Peer-Reviewed Journal Articles:

Senior or co-senior authorship: \*      Mentored student: *Italicized*      Mentored post-doctoral fellow: *Italicized*\*

1. *V. Velasco*, **P. Soucy**, R. Keynton, and S.J. Williams. “A Microfluidic Impedance Platform for Real-Time, In Vitro Characterization of Endothelial Cells Undergoing Fluid Shear Stress” *Lab on a Chip*, 2022, 22, 4705-4716. DOI: <https://doi.org/10.1039/D2LC00555G>
2. R. Chauhan, *K. Kinney*, *A. Akalkotkar*<sup>†</sup>, B. M. Nunn, R. S. Keynton, M.G. O’Toole<sup>\*</sup>, **P. Soucy**<sup>\*</sup>. “Radiation-induced Curcumin Release from Curcumin-chitosan Polymer Films.” *RSC Advances*, 2020; 10: 16110-16117. DOI: 10.1039/D0RA00144A
3. M. O’Toole, **P. Soucy**, R. Chauhan, M. Raju, D. Patel, B. Nunn, M. Keynton, W. Ehringer, M. Nantz, R. Keynton, A. Gobin. “Release-Modulated Anti-oxidant Activity of a Composite Curcumin-Chitosan Polymer.” *Biomacromolecules*, 2016; 17(4): 1253-60. DOI: 10.1021/acs.biomac.5b01019

4. **P. Soucy**, M. Hoh, W. Heinz, J. Hoh, L. Romer. "Oriented Matrix Promotes the Directional Development of Microvessels." *Acta Biomaterialia*, 2015; 11: 264-273. DOI: 10.1016/j.actbio.2014.08.037
5. *M. Scherzer*, S. Waigel, H. Donninger, V. Arumugam, W. Zacharias, G. Clark, L. Siskind, **P. Soucy**, L. Beverly. "Fibroblast-derived Extracellular Matrices: An Alternative Cell Culture System that Increases Metastatic Cellular Properties." *PloS one*, 2015; 10(9): e0138065. DOI:10.1371/journal.pone.0138065
6. M. O'Toole, R. Henderson, **P. Soucy**, B. Fasciotto, P. Hoblitzell, R. Keynton, W. Ehringer, A. Gobin. "Curcumin Encapsulation in Submicrometer Spray-dried Chitosan/Tween 20 Particles." *Biomacromolecules*. 2012; 13(8): 2309-2314. DOI: 10.1021/bm300564v
7. **P. Soucy**, J. Werbin, W. Heinz, J. Hoh, L. Romer. "Microelastic Properties of Lung Cell-derived Extracellular Matrix." *Acta Biomaterialia*. 2011; 7(1): 96-105. DOI: 10.1016/j.actbio.2010.07.021
8. K. Soucy, D. Attarzadeh, R. Ramachandran, **P. Soucy**, L. Romer, A. Shoukas, D. Berkowitz. "Single Exposure to Radiation Produces Early Anti-angiogenic Effects in Mouse Aorta." *Radiation and Environmental Biophysics*. 2010; 49(3): 397-404. DOI: 10.1007/s00411-010-0287-z
9. **P. Soucy**, L. Romer. "Endothelial Cell Adhesion, Signaling, and Morphogenesis in Fibroblast-derived Matrix." *Matrix Biology*. 2009; 28(5): 273-283. DOI: 10.1016/j.matbio.2009.04.005

## Peer-Reviewed Conference Publications & Presentations:

Senior authorship: \*                      Mentored student: *Italicized*                      Mentored post-doctoral fellow: *Italicized*<sup>†</sup>

1. R. Chauhan, *A. Akalkotkar*<sup>†</sup>, *K. Kinney*, L. Pack, B.M. Nunn, R.S. Keynton, **P. Soucy**, M.G. O'Toole. "Gamma Radiation-Triggered Drug Release from Radioprotectant Curcumin-Chitosan Polymer Films." Poster presentation at 2019 BMES Annual Meeting. (October 16-19, 2019)
2. *X. Fan*, **P. Soucy**, S. Williams, R.S. Keynton. "Direct-write Biopolymer Micro-fiber Fabrication for Microvessel Formation." Poster presentation at 2018 Biomedical Engineering Society (BMES) Annual Meeting. (October 19, 2018)
3. *X. Fan*, **P. Soucy**, M. Crain, S. Williams, R.S. Keynton. "Fabrication and characterization of biopolymer fibers for 3D oriented microvascular structure." Poster presentation at 9<sup>th</sup> International Conference on Microtechnologies in Medicine and Biology (MMB). (March 26, 2018)
4. *X. Fan*, H. Yuan, S. Berry, **P. Soucy**, M. Crain, R.S. Keynton. "Direct-write Sacrificial and Biopolymer Fibers." Oral presentation at International Fiber Society. (November 8, 2017).
5. H. Yuan, M. Crain, **P. Soucy**, S. Williams, R.S. Keynton. "Characterization of a fluidic platform for nanoscale cellular electroporation." Poster presentation at 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences ( $\mu$ TAS2017), Savannah, GA. (October 22, 2017).
6. H. Yuan, M. Crain, **P. Soucy**, S. Williams, R.S. Keynton. "Characterization of a Nanoscale Electroporation Platform Using HL-60 Cells." Poster presentation at 2017 BMES Annual Meeting, Phoenix, AZ. (October 11, 2017).
7. **P. Soucy**, M. O'Toole, B. Nunn, L. Lanceta, *A. DeCarlo*, *L. Pack*, W. Ehringer, J. Eaton, R.S. Keynton. "Drug Delivery of Antioxidants for Mitigation of Fe<sup>56</sup> Radiation Induced Cell and Tissue Damage in Mice." Poster presentation at NASA Human Research Program

- Investigators Workshop, Galveston, TX. (January 24, 2017).
8. *N. Allen, K. Soucy, R.S. Keynton, P. Soucy\**. "Gamma-Radiation Alters the Cardiovascular Extracellular Matrix." Poster presentation at 2017 NASA Human Research Program Investigators' Workshop, NASA, Galveston, TX. (January 23, 2017).
  9. *V. Velasco, P. Soucy, R.S. Keynton, S. Williams*. "Electrode topography effects on sheared HUVEC morphology within an electrical impedance system." Poster presentation at 2016 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society, San Francisco, CA. (November 13, 2016).
  10. *V. Velasco, P. Soucy, R.S. Keynton, S. Williams*. "In vitro electrical impedance characterization of HUVECs undergoing hydrodynamic shear stress." Poster presentation at 2016 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society, San Francisco, CA. (November 13, 2016).
  11. *M. O'Toole, L. Lanceta, B. Nunn, W. Ehringer, J. Eaton, R. Keynton, P. Soucy\**. "Drug Delivery of Antioxidants for Mitigation of Radiation-induced Cell Damage." Poster Presentation at NASA Human Research Program Investigators' Workshop, Galveston, TX (2016).
  12. *N. Allen, K. Soucy, R. Keynton, P. Soucy\**. "Cardiovascular extracellular matrix remodeling due to ionizing radiation exposure." Poster presentation at American Society for Gravitational and Space Research, Arlington, VA (2015).
  13. *A. Akalkotkar†, M. O'Toole, L. Lanceta, B. Nunn, J. Eaton, R. Keynton, P. Soucy\**. "Development of spray dried curcumin loaded nanoparticles to mitigate radiation induced cellular damage." Podium Presentation at 2015 Biomedical Engineering Society Annual Meeting, Tampa, FL (2015).
  14. *M. Kelecý, A. Akalkotkar†, E. Martin, W. Ehringer, P. Soucy\**. "Fabrication of Lipid Vesicles Containing Curcumin and N-(2-mercaptopropionyl)-glycine." Poster Presentation at 2015 Biomedical Engineering Society Annual Meeting, Tampa, FL (2015).
  15. *R. Chauhan, A. Akalkotkar†, B. Nunn, P. Soucy, R. Keynton, M. O'Toole*. "Stimuli responsive drug delivery system for curcumin to counteract radiation injuries." Poster presentation at Southeastern Regional Meeting of the American Chemical Society, Memphis, TN (2015).
  16. *R. Chauhan, M. Graves, B. Nunn, A. Akalkotkar†, R. Keynton, P. Soucy, M. O'Toole*. "Gamma Irradiation-Controlled Burst Release of Curcumin from Chitosan to Counteract Radiation Damage." Poster Presentation at Society for Biomaterials, Charlotte, NC (2015).
  17. *L. Lanceta, B. Nunn, A. Akalkotkar†, R. Chauhan, M. O'Toole, J. Eaton, R. Keynton, W. Ehringer, P. Soucy\**. "Nanoparticle Drug Delivery for Mitigation of Radiation-induced Damage to Lymphocytes." Podium Presentation by P. Soucy at NASA Human Research Program Investigators' Workshop, Galveston, TX (2015).
  18. *I. Jain, M. Kelecý, M. O'Toole, R. Keynton, A. Gobin, P. Soucy\**. "Crosslinking Albumin to Alter Curcumin Release from Spray Dried Particles." Poster presentation at 2014 Biomedical Engineering Society Annual meeting, San Antonio, TX (2014).
  19. *R. Chauhan, M. Graves, R. Keynton, B. Nunn, P. Soucy, M. O'Toole*. "Chitosan Drug Delivery Vehicles: Synthesis, Characterization and Controlled Drug Release Studies." Poster presentation at Southeastern Regional Meeting of the American Chemical Society, Nashville, TN (2014).
  20. *M. O'Toole, J. Eaton, W. Ehringer, A. Gobin, R. Keynton, P. Soucy\**. "Nanoparticle Formation for Antioxidant Delivery to Mitigate Cellular Damage in Humans Exposed to

- Radiation.” Podium Presentation by P. Soucy at NASA Human Research Program Investigators’ Workshop, Galveston, TX (2014).
21. **P. Soucy**, W. Ehringer, C. Klinge, H. Frieboes, A. Gobin. “An Innovative Approach for Curcumin Delivery for Breast Cancer Using Albumin Nanoparticles.” Podium Presentation at ASME 2013 2nd Global Congress on NanoEngineering for Medicine and Biology, American Society of Mechanical Engineers, Boston, MA (2013).
  22. W. Ehringer, A. Gobin, **P. Soucy**, P. Hoblitzell, M. O’Toole, B. Totten, R. Keynton. “Curcumin Alters Membrane Phase-separation, Particle Size Distribution, Permeability, and Anisotropy Differently in Unsaturated or Saturated Small Unilamellar Vesicles.” Poster presentation at Biophysical Society, San Diego, CA (2012).
  23. *I. Jain*, **P. Soucy**, M. O’Toole, B. Fasciotto, P. Hoblitzell, R. Keynton, W. Ehringer, A. Gobin. “Increasing Curcumin Solubility via Spray Dried Albumin Particles.” Poster presentation at 2012 Biomedical Engineering Society Annual Meeting, Atlanta, GA (2012).
  24. **P. Soucy**, *I. Jain*, M. O’Toole, B. Fasciotto, P. Hoblitzell, R. Keynton, W. Ehringer, A. Gobin. “Curcumin Delivery from Spray Dried Albumin Particles.” Poster presentation at Sullivan University Nanotechnology and Nanomedicine Symposium, Louisville, KY (2012).
  25. W. Ehringer, A. Gobin, **P. Soucy**, P. Hoblitzell, M. O’Toole, B. Totten, R. Keynton. “Curcumin Alters Membrane Phase-Separation, Particle Size Distribution, Permeability, and Anisotropy Differently in Unsaturated or Saturated Small Unilamellar Vesicles.” Poster presentation at Biophysical Society Annual Meeting, San Diego, CA (2012).
  26. M. O’Toole, **P. Soucy**, B. Fasciotto, P. Hoblitzell, R. Keynton, W. Ehringer, A. Gobin. “Curcumin Encapsulation in Sub-micron Spray-dried Chitosan/Tween 20 Particles.” Poster presentation at U.S. – Japan Symposium on Drug Delivery Systems, Honolulu, HI (2011).
  27. **P. Soucy**, A. Porter, M. Keynton, A. Gobin. “Endothelial Cell Response to Poly Ethylene Glycol Hydrogels Containing Basic Fibroblast Growth Factor.” Poster presentation at Tissue Engineering and Regenerative Medicine International Society, Houston, TX (2011).
  28. M. O’Toole, R. Henderson, **P. Soucy**, B. Fasciotto, P. Hoblitzell, R. Keynton, W. Ehringer, A. Gobin. “Formulation of Curcumin-modified Chitosan Nanoparticles for Prolonged Systemic Bioavailability.” Poster presentation at 2011 Biomedical Engineering Society Annual Meeting, Hartford, CT (2011).
  29. **P. Soucy**, *I. Jain*, B. Totten, M. O’Toole, P. Hoblitzell, R. Keynton, W. Ehringer, A. Gobin. “Curcumin Uptake and Effects on Gamma Irradiated Cells.” Poster presentation at 2011 Biomedical Engineering Society Annual Meeting, Hartford, CT (2011).
  30. **P. Soucy**, M. Mikhaylova, W. Heinz, J. Hoh, L. Romer. “Oriented Matrix Promotes the Directional Development of Microvessels.” Poster presentation at American Society of Cell Biology Annual Conference, San Diego, CA (2009).
  31. **P. Soucy**, J. Hoh, L. Romer. “Endothelial Tube Formation on Fibroblast-Derived Matrices.” Poster presentation at Biomedical Engineering Society Annual Conference, St. Louis, MO (2008).
  32. **P. Soucy**, J. Hoh, L. Romer. “Generating and Characterizing Fibroblast-Derived Extracellular Matrix as a Scaffold for Vascular Endothelial Morphogenesis.” Poster presentation at Gordon Conference on Signal Transduction by Engineered Extracellular Matrices, Lewiston, ME (2008).
  33. **P. Arauz**, J. Hoh, L. Romer. “Endothelial Cell Adhesion in Three Dimensions.” Poster presentation at American Society of Cell Biology Annual Conference, Washington D.C. (2007).

34. **P. Arauz**, C. Lemmon, J. Hoh, L. Romer. “Endothelial Adhesion in Fibroblast-Derived 3-D Matrix.” Poster presentation at Biomedical Engineering Society Annual Conference, Chicago, IL (2006).
35. **P. Arauz**, R. Willits. “Collagen and Hydroxyapatite Incorporation into Poly (Ethylene Glycol) Hydrogels for Orthopedic Applications.” Poster presentation at American Society of Mechanical Engineers Summer Bioengineering Conference, Key Biscayne, FL (2003).
36. **P. Arauz**, R. Willits. “Effect of Hydrogel Physical Properties on Osteoblast Proliferation.” Poster presentation at Second Joint EMBS-BMES Conference, Houston, TX (2002).
37. **P. Arauz**, B. Kelso, R. Willits. “Effect of Hydrogel Properties on Osteoblast Growth and Function.” Poster presentation at Society for Advancement of Chicanos/Hispanics and Native Americans in Science National Conference, Anaheim, CA (2002).
38. **P. Arauz**, R. Willits. “Influence of Hydrogel Structure on Osteoblast Function.” Poster presentation at Materials Research Society Symposium Proceedings, San Francisco, CA (2002).

### Invited Presentations:

1. **P. Soucy**. A Paradigm-Shifting Therapy for Mitigating Cellular and Tissue Damage in Humans Exposed to Radiation. NASA Space Grant Directors Annual Meeting. Alexandria, VA (2016).
2. **P. Soucy**. Design of Drug Delivery Vehicles for Curcumin. Saint Louis University Department of Biomedical Engineering, St. Louis, MO (2015).
3. **P. Soucy**. Translational Research: Oxidative Stress and Damage, and Immunology III. Invited Panel member. NASA Human Research Program Investigators’ Workshop, Galveston, TX (2015)

### Sponsored Projects:

#### Total Funding (2013 - present)

**TOTAL: \$1,230,143**

#### Current:

- **Industry Contract with Samtec, Inc** \$42,261  
 “Hydrogel Production”  
**Role: PI (10% effort)**  
 1/1/23-9/30/24  
 Project Summary: Fabrication of hydrogels with defined physical properties on molds and films provided for Samtec, Inc use.
  
- **NIH, National Eye Institute R01 (1R01EY030060-01A1)** \$245,691  
 “Role of MRTF signaling in proliferative vitreoretinopathy”  
**Role: Subaward PI (10% effort)**  
 1/1/2020 - 12/31/2024  
 Project Summary: Proliferative vitreoretinopathy (PVR) is a fibrotic complication characterized by formation and contraction of scar tissue on the retinal surface, resulting in retinal folds and/or traction retinal detachment. The overall goal of this project is to unravel molecular mechanisms involved in PVR development to identify targets for potential intervention in *in vitro* and *in vivo* models.

## Completed:

- **Industry Contract with PromiSight, Inc** \$37,191  
“Production of HydroLenz Particle”  
**Role: PI** (1% effort)  
3/1/2018 – 6/30/2022  
Project Summary: The project work involved manufacture and characterization of HydroLenz particles for PromiSight, Inc using a Buchi B-90 spray-dryer.
- **University of Louisville Intramural Research Incentive Grant** \$5,000  
“Radiation Induced Extracellular Matrix Remodeling”  
**Role: PI**  
1/2015 - 12/2015  
Project Summary: The extracellular matrix (ECM) properties have been shown to alter cell function and morphogenesis, which may accelerate degenerative pathophysiological conditions. This project examined radiation induced changes to ECM produced by fibroblasts, which ultimately resulted in a remodeled ECM with distinct properties.
- **NASA EPSCoR (NNX13AD33A)** \$675,000  
“A Paradigm-Shifting Therapy for Humans Exposed to Radiation”  
**Role: Science PI** (10% effort)  
1/2013 - 12/2016  
Project Summary: The primary goal of this project was to develop a proof-of- concept prototype system to mitigate the effects of low and high LET radiation through optimization of precisely engineered drug delivery systems to maximize the systemic delivery of three specific radio-protective agents.
- **KY Space Grant Consortium/ University of Kentucky Research Foundation (3048110401-13-216)** \$225,000  
“A Paradigm-Shifting Therapy for Humans Exposed to Radiation”  
**Role: PI** (7% effort)  
1/2013 - 12/2016  
Project Summary: This was a subaward in support of the NASA EPSCoR grant listed above.

## Technology Disclosures:

- **P. Soucy, M. O’Toole, R. Keynton.** “Radiation Induced Polymer Degradation for Drug Delivery,” ULRF Disclosure 15024, submitted October 30, 2014.
- **M. O’Toole, A.S. Gobin, R. Keynton, P. Soucy, B. Fasciotto, W. Ehringer.** “Hybrid Chitosan-Curcumin polymeric nanoparticles for mitigation of radiation damage” ULRF Disclosure No. 13015, submitted September 12, 2011.

## Research Service:

- Bioengineering Department Confocal Microscope: managed and provided support and training for Bioengineering faculty and collaborators to utilize this equipment

## **TEACHING ACTIVITY**

### **Courses Taught:**

- BE 354: Anatomy & Physiology, 3 credit hour undergraduate core course, Primary Professor
- BE 450: Biomaterials & Biocompatibility, 3 credit hour undergraduate core course, Primary Professor
- BE 654: Advanced Physiology for Engineers, 3 credit hour graduate core course, Primary Professor
- BE 552: Introduction to Tissue Engineering, 3 credit hour graduate elective course, Primary Professor
- BE 491: Capstone A: Economics, Ethics, & FDA Regulations, 3 credit hour undergraduate core course, Course Coordinator and Co-Instructor
- BE 693: Bioengineering Independent Study, 3 credit hour graduate elective course, Primary Professor Spring 2017
- IDEP-913: Medical Education Independent Study, medical school elective course, Primary Professor Fall 2019-Spring 2020
- BE 101: Introduction to Bioengineering, Guest Lecturer on Tissue Engineering

### **Curriculum Development:**

- BE 354: Developed Anatomy and Physiology course with updated textbook as a core Bioengineering undergraduate course.
- BE 450: Adapted and redesigned Biomaterials & Biocompatibility course as a core Bioengineering undergraduate course.
- BE 654: Developed Advanced Physiology for Engineers course with updated textbook and mathematical models of physiological systems as a core Bioengineering graduate course.
- BE 552: Developed Introduction to Tissue Engineering course, which is an elective course in the Bioengineering undergraduate and graduate programs.
- BE 491: Redesigned the FDA portion of Economics, Ethics, & FDA Regulations as a core Bioengineering undergraduate course that is taken as a co-requisite with the Capstone course.
- Online Adaptation: Developed online sections for BE 354, BE 450, BE 552, & BE 654.

### **Professional Development:**

- University of Louisville's Deans Forum on Educational Excellence: Student Retention (2023)
- NIH, Building a Resilient Scientist Training (2023)
- University of Louisville's Equity, & Inclusion: Implicit Bias, Microaggressions, & Antiracism (2023).
- Prevention, Education, & Advocacy on Campus & in the Community (PEACC)'s Green Dot Bystander Training (2021).
- University of Louisville's Delphi Celebration of Teaching and Learning (2017, 2022)
- University of Louisville's Delphi U Online Teaching Training (Spring 2018, Summer 2020)



### Course Evaluations (In-Class Sections):

<u>Course</u>	<u>Student Evaluation Score [Scale 1 (min) to 5 (max)]</u>										<u>Avg</u>
	2013	2014	2015	2016	2017	<u>(# of students enrolled)</u>					
BE 354	3.33 (38)	4.23 (25)	--	--	4.27 (40)	--	4.11 (34)	4.25 (29)	4.72 (37)	4.43 (29)	4.19
BE 450	3.88 (30)	3.75 (28)	3.47 (41)	4.16 (39)	--	3.55 (30)	3.74 (33)	--	--	--	3.76
BE 491	--	--	--	--	--	--	3.99 (36)	3.85 (36)	3.6 (21)	4.34 (34)	3.95
BE 552	--	--	--	--	--	4.32 (19)	4.48 (13)	4.58 (7)	4.71 (7)	4.94 (9)	4.61
BE 654	4.44 (18)	4.36 (13)	4.08 (20)	4.50 (16)	4.36 (25)	4.48 (21)	4.63 (19)	4.41 (13)	4.91 (10)	4.39 (14)	4.45

### Average Teaching

---

Evaluation Score (2013 - present): 4.2

### Course Evaluations (Online Sections):

<u>Course</u>	<u>Term</u>	<u># of Students Enrolled</u>	<u>Student Evaluation Score:</u>
			<u>Scale 1 (min) to 5 (max)], NR= no response</u>
BE354-50	Spring 2022	20	4.47
BE354-50	Summer 2022	8	4.48
BE654-50	Fall 2021	3	4
BE354-50	Fall 2021	20	3.7
BE354-50	Summer 2021	5	4.88
BE654-50	Spring 2021	4	4.58
BE354-50	Spring 2021	16	3.61
BE654-50	Fall 2020	1	NR
BE354-50	Fall 2020	9	4.75
BE654-50	Summer 2020	4	4.25
BE 354-50	Summer 2020	3	NR
BE 354-50	Spring 2020	3	NR
BE 654-50	Spring 2020	2	5.00
BE 354-50	Fall 2019	2	5.00
BE 654-50	Fall 2019	1	4.25
BE 354-50	Summer 2019	1	NR
BE 450-50	Summer 2019	3	NR
BE 354-50	Spring 2019	2	NR
BE 552-50	Spring 2019	4	3.63
BE 654-50	Fall 2018	1	5.00
BE 450-50	Summer 2018	3	3.75

### Average Online Teaching Evaluation

---

Score (2018 - present): 4.36

## **Student Mentoring:**

### **Post-Docs:**

1. Archana Akalkotkar, PhD. (Bioengineering, 2014-2015): Nanoparticle fabrication for delivery of radio-protective agents.  
Current Position: Research Scientist at Charles River Laboratories

### **Masters Theses Directed:**

1. Daniel Benson (Bioengineering, M.Eng, 2022): Establishing the Efficacy of non-Cellular Components of Adipose derived Stromal Vascular Fraction in Promoting Angiogenesis (co-mentor with Amanda LaBlanc).
2. Allie DeCarlo (Bioengineering, M.Eng, 2018): Investigation of Cardiovascular Tissue Following <sup>56</sup>Fe Radiation and Potential Countermeasure Effectiveness.  
Current Position: Associate Scientist at Peptides International, Inc.
3. Nicholas Allen (Bioengineering, M.Eng, 2016): Cardiovascular Extracellular Matrix Remodeling Due to Ionizing Radiation Exposure.  
Current Position: PhD Student in Interdisciplinary Studies with Specialization in Translational Bioengineering, University of Louisville
4. Emily Martin (Bioengineering, M.Eng, 2016): Transdermal Delivery of Antioxidants with Lipid Vesicles.  
Current Position: Medical Degree from University of Louisville in 2020, Residency at Emory University Hospital
5. Michael Scherzer (Bioengineering, M.Eng, 2015): Fibroblast-derived Extracellular Matrix: An Alternative Cell Culture Substrate that Alters Lung Cancer Cell Phenotype (co-mentor with Levi Beverly).  
Current Position: PhD Program, University of Utah
6. Brian Gettler (Bioengineering, M.Eng. 2014): Fabrication and Characterization of Antioxidant Loaded Liposomes.  
Current Position: Biomechanical Engineer, Techshot, Inc.
7. Ishita Jain (Bioengineering, M.Eng. 2014): Crosslinking Albumin for Drug Release from Spray Dried Particles.  
Current Position: Medical Degree from University of Louisville in 2019, Residency at Rush University Medical Center

### **Dissertation and Theses Committees:**

1. Kayla Montgomery, M.Eng. Bioengineering Department, 2023, thesis committee member: Thermal Imaging of Diagnostic Catheters for Electrical Failure Troubleshooting.
2. Nicholas Allen. Interdisciplinary Studies with Specialization in Translational Bioengineering, Doctoral Dissertation, 2023, dissertation committee member: Synthesis and Evaluation of Tumor Targeting Gold Nanoparticles for the Passive Release of RNAi Therapies for Glioblastoma Treatments.
3. Riya Patel, M.Eng. Bioengineering Department, 2022, thesis committee member: Acoustofluidic Delivery of Gene Editing Compounds for Improved Immunotherapy Processing.
4. Alexa Melvin. Interdisciplinary Studies with Specialization in Translational Bioengineering, Doctoral candidate, proposal defense 2019, dissertation committee member: Development of a Differential Scanning Calorimetry Blood Testing Device to Diagnose Myocardial

Infarctions.

5. Xiaoming Fan, PhD. Mechanical Engineering, 2019, co-mentor & dissertation committee: Development and Characterization of Biopolymer Direct-write Process for Microvascular Structures Formation.
6. Glenn Vicary, PhD. Department of Pharmacology and Toxicology, 2016, dissertation committee member: Nicotine promotes alterations in lung extracellular matrix, exaggerated inflammation and fibrosis.
7. Vanessa Velasco, PhD. Mechanical Engineering, 2016, dissertation committee member: Microfluidic Platform for Impedance Characterization of Endothelial Cells under Fluid Shear Stress.
8. David Alston, M.Eng. Bioengineering Department, 2014, thesis committee member: Development of an Application for Patient-centered Dementia Care.

### **Undergraduate Student Research:**

1. Owen Kresse (Bioengineering Research Volunteer, 2023): Cell Culture for Retinal Fibrosis Models
2. Jacob Frank (Bioengineering Research Volunteer, 2022): Characterization of Mechanical Properties of Retina
3. Nick Huffman (Bioengineering Research Volunteer, 2018): Endothelial Capillary Formation with Degradable Nanofibers
4. Megan Snodgrass (Bioengineering Research Volunteer, 2017): Production of Polyacrylamide Gels of Varying Stiffness
5. Larissa Pack (Bioengineering, Research Volunteer, 2016): Crosslinking Albumin Particles
6. Jacob Marguet (Mechanical Engineering, Research Volunteer, 2015): Quantification of Cell Protein Expression Following Radiation Exposure
7. Matthew Kelecy (Bioengineering, Research Volunteer, 2015): Dual Antioxidant Loaded Lipid Vesicle Fabrication
8. Nicholas Allen (Bioengineering, Research Volunteer, 2014-2015): Production of Cardiac Fibroblast Extracellular Matrix
9. Emily Martin (Bioengineering, Research Volunteer, 2014-2015): Cytotoxicity of Crosslinked Albumin Particles
10. Ben Taussig (Chemical Engineering, Research Volunteer, 2014): Enhanced Cell-derived Extracellular Matrix Production
11. Jessica McQuaide (Bioengineering, Research Volunteer, 2013): Production of Dermal Fibroblast Extracellular Matrix

### **Other Bioengineering Student Mentorship:**

1. Larissa Pack (Bioengineering, Co-op Researcher, 2017): Single Cell Transfection Viability
2. Kelsey Kinney (Bioengineering, BE 691: Biomedical Rotation Project, 2015): Fabrication and Characterization of Curcumin-Loaded Patches for Transdermal Delivery
3. Matthew Kelecy (Bioengineering, Co-op Researcher, 2014): Crosslinked Albumin Particles for Extended Drug Release
4. Kelsey Kinney, Jessica McQuaide, Laura Vallado (Bioengineering, Senior Capstone project co-mentor, 2014): Drug Delivery Device for Hemophilia
5. Nicholas Allen (Biomedical Engineering, Co-op Researcher, 2013): Production of Cardiac

### **Honors and Recognition of Students Advised & Mentored:**

- **Ekaterina Kovatsenko** received a Fulbright English Teaching Assistantship, 2022.
- **Nicholas Allen** received the Bioengineering Alumni Award, University of Louisville, 2016.
- **Matthew Kelecy** received the Mickey R. Wilhelm Achievement Award, Bioengineering Department, University of Louisville, 2016.
- **Jessica McQuaide** received the Bennet M. Brigman Award, J.B. Speed School, University of Louisville, 2016.
- **Ishita Jain** was selected for a Whitaker International Program Summer grant to work with the European Space Agency, 2014.
- **Ishita Jain** received the Graduate Dean's Citation award, University of Louisville, 2014.
- **Nicholas Allen** received the Judi Olsen Endowed Scholarship Fund award, Bioengineering Department, University of Louisville, 2014.
- **Nicholas Allen** received an Undergraduate Summer Research Opportunity Program grant, University of Louisville, 2013.

### **PROFESSIONAL AND SERVICE ACTIVITIES**

#### **Professional Affiliations:**

- Society of Women Engineers (SWE) – member (2014 - 2019)
- Biomedical Engineering Society (BMES) – member (2013 - present)

#### **Professional Service:**

#### **Professional Organization Leadership:**

- Biomedical Engineering Society Election Process Review, committee member (2021-2022)

#### **Grant Panel Reviewer:**

- KY NASA EPSCoR Grant Reviewer (2014, 2015, 2017)

#### **Journal Reviewer:**

- Journal of Biomedical Materials Research (2014 - present)
- Biomacromolecules (2013 - present)
- Acta Biomaterialia (2013 - present)

#### **Conference Abstract Reviewer:**

- Biomedical Engineering Society Annual Conferences (2013 - 2018)

#### **University of Louisville Service:**

#### **J.B. Speed School of Engineering Service:**

- Society of Women Engineers (SWE) Faculty Advisor (2014 - 2019)

- Approximately 50 active SWE student members in our section
- Organized annual SWE event for incoming female Speed School students (20 - 30 attendees each year)
- Organized annual Women in Speed Luncheon with Speed School students, faculty, and staff (50+ attendees)
- Represented SWE and Bioengineering in panels for high school students interested in engineering (3+ panels / year)
- Supported and encouraged community outreach (minimum of 4 events/ year)
  - Student leadership and technology programs (SLTP)
  - Engineering expositions
  - Speed School's Women's Leadership Conference
  - Girls STEM+H event
- Mentored SWE officers writing proposals for funding to attend annual conferences

**Honors and Recognition from SWE to our Collegiate Section:**

- Gold Achieving Collegiate Section Award (2019)
- Best practices in Communication Award (2019)
- Silver Achieving Collegiate Section Award (2017, 2018)
- First Place Communication Award at the SWE Region G Conference (2016)

**SWE Student Presidents Advised:**

- Lucy Kurtz, Bioengineering student
- Laura Edkins, Industrial Engineering student
- Holly McTaggart, Industrial Engineering student
- Jessica McQuaide, Bioengineering student

**Honors and Recognition of Students Advised& Mentored Through Service Activities:**

- **Lucy Kurtz** received 2020 - 2021 Fulbright Scholarship to Canada.
- **Lucy Kurtz** received the Jill S. Tietjen, P.E. Scholarship, Society of Women Engineers Merit Scholarship, October 2019.
- **Holly McTaggart** received the SWE Outstanding Collegiate Member Award at SWE's National Conference, October 2017.
- Speed School Ideas to Action committee member representing the Bioengineering Department (2013 - 2014)

**Department of Bioengineering Service:**

- Director of Graduate Studies for Bioengineering (2022-)
- Graduate Council Representative for Interdisciplinary PhD Programs (2022-)
  - Awards Subcommittee (2022-)
- Speed School Graduate Education Committee representative for Bioengineering (2022-)
- Bioengineering Faculty Search Committee Chair (2022)
- Chemical Engineering Faculty Search Committee Member (2021)
- Co-Coordinator of Interdisciplinary Studies with Specialization in Translational Bioengineering PhD Program (2018 - present)
  - Implemented and managed the new PhD program
  - Evaluated applications from all prospective students

- Advised 19 PhD students
- Evaluated student progress each semester relative to academic flight plan
- Organized and administered qualifying exams and other benchmarks for the program
- Coordinated efforts and served as primary contact for proposal to move the current program into Speed School as a PhD in Translational Bioengineering
- Co-Coordinator of Masters of Science in Bioengineering Program (2020 - present)
  - Implemented and managed the new Masters of Science program
  - Evaluated applications from all prospective students
  - Advised 11 MS students
- ABET Continuous Improvement Committee (2016 - present)
- ABET Assessment Committee (2014 - 2016)
  - Collected and prepared annual analysis of ABET Assessment #3 for Bioengineering Department
- Prospective Student Committee (2013 - 2015)
  - Interacted with prospective students to discuss the Bioengineering Department, in-person or phone meetings
- Bioengineering Department Curriculum Committee (2014 - 2015)
  - Reviewed syllabi for new BE courses
- Bioengineering Chair Search Committee (2016)
- Bioengineering Faculty Search Committees Member (2013 - 2015)

### **Community Service:**

- Sacred Heart Academy Lunch and Learn on Engineering (2023)
- Represented Bioengineering in Engineering Days at Kentucky Science Center (2022)
- Presented on behalf of the Bioengineering Department at the Brown Foreman Engineering Academy (2018 - 2021)
- Girl Scouts of Kentuckiana Troop Leader, Troop #506 (2015 - present)
- Presented to Sacred Heart Academy Engineering Club (2017)
- Participated in Sacred Heart Academy's STEM Community Partnership Team (2016)
- Participated in Speed School's Women in Engineering Day (2015 - 2018)
- Participated in Increasing Student Preparedness and Interest in the Requisites for Engineering (INSPIRE) (2013)
- Participated in Engineering Club at Brandies Elementary (2013)
- Participated in NASA KY Day in Kentucky State University (2013)