

Executive Summary of the Curriculum Vitae

Abigail N. Koppes Ph.D.

Department of Chemical Engineering
Northeastern University
360 Huntington Ave, 313 Snell Engr
Boston, MA, 02115
Phone: (613) 373 622

Email: a.koppes@northeastern.edu
Lab site: <http://www.northeastern.edu/abnel/>
Home: <http://www.che.neu.edu/people/koppes-abigail>
ORCID <https://orcid.org/0000-0003-0433-9290>

Research Profile

- Secured as PI or contributed as Co-I to \$7M in total active external competitive funding
 - PI on NIH NIBIB Trailblazer R21 \$200,000 DC (50%) (\$628,000.00 total)
 - Co-I on NIH NIBIB R01 Biomedical Research Partnership \$184,991.71 DC (15%) (\$6.25M total)
 - Co-I on AHA Innovation Award \$50,000 DC (25%)(\$200,000 total).
- Secured \$50,000 in internal research funding, supported over \$20k in UG fellowship awards
- Peer-reviewed journal articles: 27, Google Scholar h-index: 13
 - Of these, number as corresponding is: 11 (+ 2 more in review; 1 as corresponding)
- Patents Pending and Disclosures: 3
- Book Chapters: 2
- Invited talks: 17 (+5 scheduled)
- Conference Proceedings: 29 Podiums and 34 Posters (+4 pending)
- 2020 Young Innovator in Cellular and Molecular Bioengineering (*BMES CMBE*)

Teaching Profile

- Coordinated, Designed, and taught 8 semesters of undergraduate Unit Operations/Transport I Design Laboratory
- Developed and taught Design of Experiments and Ethical Research (RCR) for 2 semesters to undergraduates and graduate students
- Average instructor score: 4.69/5.00 (Dept Ave: 4.26/5.00, Uni Ave: 4.36/5.00)
- 4 Ph.D. supervised have graduated thus far, 3 MS student theses have graduated thus far
 - Jobs at Pfizer, NIH, Seven Bridges Genomics, Blue Bird Bio, Ocular Therapeutix, Inc.
- Active supervision of a total of 12 graduate students
- Have supervised 37 diverse undergraduates in laboratory research at NEU thus far
 - Goldwater, Mitchell, internal funding awards, and publication contributions
 - UGs to graduate school JHU, Northwestern, Stevens, Cork, and STEM industry positions

Service Profile

- NIH SEP DKUS Reviewer 2018-2019
- DoD CDMRP/NSF CBET/NIH SPARC and NIH NIGMS Ad Hoc Reviewer
- *Track Chair* for Neural Engineering 2018 Biomedical Engineering Society
Session Chair Neuro/Biomat/Stem cells since 2016
- *Area Chair* for 15d/e Food, Pharmaceutical, and Bioengineering for American Institute of Chemical Engineers, *Session chair* for 15d/e and 8b since 2015-16
- Elected to *BMES Diversity Committee* 2020-2023
- AIChE Women's Initiative Committee Fall Programming Committee 2016-2018
- Annually review > 12 papers in journals such as PNAS, Lab-on-a-chip, Acta Biomater, ACS, SMALL
- Northeastern University Graduate Committee 2014-
- Outreach to K12 via summer research internships, workshops, and STEAM events
- NPR WHYY The Pulse Podcast 9/13/19 <https://www.npr.org/podcasts/381443461/the-pulse>;
- [Engineering Crash Course](#): Youtube. Contributed to episodes: #36, 37, and 38

Comprehensive Curriculum Vitae

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Phone: (613) 373 6221

Email: a.koppes@northeastern.edu
Home:
<http://www.che.neu.edu/people/koppes-abigail>
Lab Site: <http://www.northeastern.edu/abnel/>
ORCID <https://orcid.org/0000-0003-0433-9290>

Education

- 2008–2013 Ph.D., Biomedical Engineering, Rensselaer Polytechnic Institute
Thesis Title: Application of low-level DC electrical stimulation in 2D and 3D microenvironments to direct neurite outgrowth for the treatment of large-gap peripheral nerve injuries. Supervisor: Deanna Thompson
- 2008–2010 M.Sc., Biomedical Engineering, Rensselaer Polytechnic Institute
- 2003–2008 B.Sc., Biomedical Engineering, Rensselaer Polytechnic Institute

Employment History

- 2014– Present Assistant Professor, Chemical Engineering, Northeastern University, affiliate Depts of Biology and Bioengineering
- 2013–2015 Visiting Scholar, Bioengineering, Massachusetts Institute of Technology
- 2013–2014 NSF ADVANCE Future Faculty Fellow, Chemical Engineering, Northeastern
- 2013–2014 Postdoctoral Fellow, Harvard Medical School, and Schepens Eye Research Institute
- 2007–2008 Engineering Consultant, Ultradian Diagnostics, LLC
- 2007–2007 Diabetes Association Intern, Cleveland Clinic Lerner Research Institute
- 2006–2006 NSF REU Co-op, Biomedical Engineering, Cleveland Clinic Lerner Research Institute
- 2005–2005 NIH Intern, Neuroscience and Neuropharmacology, Albany Medical College

Publications

Full list of publications at:

<https://scholar.google.com/citations?hl=en&user=GUXplvwAAAAJ>

Google Scholar h-index 13

Google Scholar Citations: 801

Peer-Reviewed Journal Publications *Undergraduate, also published surname Eldridge

1. Ventre, Daniel; Cluff*, Avery; Gagnon* Christian; Koppes, Ryan; and **Koppes, Abigail**. The Effects of Low Intensity Focused Ultrasonic Stimulation on Dorsal Root Ganglia Neurons and Schwann Cells In Vitro. Invited International Women's Day Issue, *Journal of Neuroscience Research*, 2018 IF = 4.139. *accepted pre-print July 2020*.
2. Hosic, Sanjin; Lake, Will; Stas, Eric; Koppes, Ryan; Breault, David; Murthy, Shashi; **Koppes, Abigail**. Cholinergic activation of primary human derived intestinal epithelium does not ameliorate TNF- α induced injury. *Cellular and Molecular Bioengineering* (Journal of BMES), CMBE 2020 Young Innovator Issue. 2019 IF = 2.416. (2020). doi.org/10.1021/acsbiomaterials.0c00190.
3. Hosic, Sanjin; Puzan, Marissa; Zhou, Fanny; Koppes, Ryan; Breault, David; Murthy, Shashi; and **Koppes, Abigail**. Rapid prototyping of a multilayer microphysiological

- system for primary human intestinal epithelial culture. *ACS Biomaterials Science & Engineering* (2020). 2019 IF = 4.152. doi.org/10.1021/acsbiomaterials.0c00190.
4. Torregrosa, Tess; Webster*, Sophie; Aghaizu*, Chiamaka; Bertucci, Christopher; Plantt, Leigh; **Koppes, Abigail**; and Koppes, Ryan. Cryopreservation and functional analysis of cardiac autonomic sympathetic and parasympathetic neurons. *Journal Neuroscience Methods*. 2018 IF = 2.785. 341, 15. (2020). doi.org/10.1016/j.jneumeth.2020.108724.
 5. Nichols, Kyla; Koppes, Ryan; **Koppes, Abigail**. Recent advancements in microphysiological systems for neural development and disease. Invited Review; *Current Opinion in Biomedical Engineering*. IF = n/a. (2020). doi.org/10.1016/j.cobme.2020.05.003.
 6. Snyder, Jessica; Wang, Chia Ming; Zhang, An Qi; Li, Yuan; Luchan, Joshua; Husic, Sanjin; Koppes, Ryan; Carrier, Rebecca; and **Koppes, Abigail**. Materials and microenvironments for engineering the intestinal epithelium. Invited review; *Annals of Biomedical Engineering*. 2019 IF = 3.378. (2020). doi.org/10.1007/s10439-020-02470-8.
 7. Soucy, Jon; Bindas, Adam; **Koppes, Abigail**; and Koppes, Ryan. Instrumented Microphysiological Systems for Real-time Measurement and Manipulation of Cellular Electrochemical Processes. Invited review. *iScience*. 2019 IF = 5.8. 21, 521–548. (2019). doi.org/10.1016/j.isci.2019.10.052.
 8. Soucy, Jon; Askaryan*, Jody; Diaz, David; **Koppes, Abigail**; Annabi, Nasim; and Koppes, Ryan. Glial cells influence cardiac permittivity as evidenced through in vitro and silico models. *Biofabrication*. 2019 IF = 8.213. 12 015014 (2019).doi: 10.1088/1758-5090/ab4coa
 9. Bertucci, Christopher, Koppes, Ryan, Dumont, Courtney, **Koppes, Abigail**. Neural responses to electrical stimulation in 2D and 3D in vitro environments. *Brain Research Bulletin*. 2019 IF = 3.150. Volume 152, Pages 265-284. (2019). doi.org/10.1016/j.brainresbull.2019.07.016, invited review.
 10. Ziemba, Alexis; D'Amato, Anthony; MacEwen, Taylor; Puhl, Devan; **Koppes, Abigail**; Koppes, Ryan; Lennartz, Michelle; Gilbert, Ryan. Stabilized interleukin-4-loaded poly(lactic-co-glycolic) acid films shift pro-inflammatory macrophages towards a regenerative phenotype in vitro. *ACS Applied Bio Materials*. IF = n/a. 2, 4, 1498-1508. (2019). doi.org/10.1021/acsbm.8b00769.
 11. Puzan, Marissa, Husic, Sanjin, Ghio, Caroline*, and **Koppes, Abigail**. Enteric Nervous System Regulation of Intestinal Stem Cell Differentiation, Epithelial Monolayer Health, and Inflammation. *Scientific Reports*. 2019 IF = 4.011. Vol 8, Article number: 6313. (2018). DOI: 10.1038/s41598-018-24768- 3.
 12. Ventre, Daniel; Puzan, Marissa; Ashbolt, Emily*; **Koppes, Abigail**. Enhanced total neurite outgrowth and secondary branching in dorsal root ganglion neurons elicited by low-intensity pulsed ultrasound. *Journal of Neural Engineering*. 2019 IF = 4.810. Vol 15, 046013. (2018). DOI:10.1088/1741- 2552/aabeba/meta.
 13. Puzan, Marissa, Legesse, Belete, Koppes, Ryan Fenniri, Hicham, and **Koppes, Abigail**. Bioactive Organic Rosette Nanotubes Support Sensory Neurite Outgrowth. *ACS Biomaterials Science and Engineering*. 2019 IF = 4.152. Vol 4 (5), 1630-1640. (2018). DOI:10.1021/acsbiomaterials.8b00326.
 14. Soucy, Jonathan, Shirzaei Sani Ehsan, Weis, Anthony, **Koppes, Abigail**, Koppes, Ryan, Annabi, Nasim. Photocrosslinkable Gelatin/Tropoelastin Hydrogels for Peripheral Nerve Repair. *Tissue Engineering A*. 2019 IF = 3.680. (2018). DOI:10.1089/ten.TEA.2017.0502.
 15. Spencer, A., Primbetova, A.,*, **Koppes, A.N.**, Koppes, R.A., Fenniri, H., and Annabi, A. Electroconductive Gelatin Methacryloyl-PEDOT:PSS Composite Hydrogels: Design, Synthesis, and Properties. *ACS Biomaterials Science and Engineering*. Vol 4 (5), pp 1558–1567. (2018). 2019 IF = 4.490. DOI: 10.1021/acsbiomaterials.8b00135.
 16. **Koppes, Abigail**, Kamath, Megha, Pfluger, Courtney, Burkey, Daniel, Dokmeci, Mehmet R., Wang, Lin, and Carrier, Rebecca L. Complex, multi-scale small intestinal

- topography replicated in cellular growth substrates fabricated via chemical vapor deposition of Parylene C. *Biofabrication*. 2019 IF = 8.213. 8, 035011. (2016). DOI: 10.1088/1758-5090/8/3/035011.
17. Ventre, Daniel, and **Koppes, Abigail**. The Body Acoustic: Ultrasonic Neuromodulation for Translational Medicine. *Cells, Tissues, and Organs*. 2019 IF=1.6. 202: 23–41, DOI:10.1159/000446622. Review.
 18. Hosisic, Sanjin, Murthy, Shashi K, and **Koppes, Abigail**. Microfluidic Sample Preparation for Single Cell Analysis. *Analytical Chemistry*. 2019 IF = 6.785. 88, 1:354–380, (2015). DOI: 10.1021/acs.analchem.5b04077. Review.
 19. **Koppes, Abigail**, Keating*, Kevin W, McGregor*, Alex L, Koppes, Ryan A, Kearns, Kathryn R, Ziemba, Alexis, McKay, Christopher, Zuidema, Jonathan M, Rivet, Christopher, Gilbert, Ryan J, Thompson, Deanna M. Robust neurite extension following exogenous electrical stimulation within single-walled carbon nanotube composite hydrogels. *Acta Biomaterialia*. 2019 IF = 7.242. Vol: 39. pp. 34-43. (2016). DOI:10.1016/j.actbio.2016.05.014.
 20. Thompson, Deanna M, **Koppes, Abigail**, Hardy, John, and Schmidt, Christine E. Electrical Stimulation of the CNS Microenvironment. *Annual Review of Biomedical Engineering*. 2019 IF = 12.257. Vol: 16. pp. 397-430. (2014). DOI: 10.1146/annurev-bioeng-121813-120655. Review.
 21. **Koppes, Abigail**, Rivet, Christopher, Zaccor*, Nicholas, Gilbert, Ryan, and Thompson, Deanna. Neurite Outgrowth On Electrospun PLLA Fibers Is Enhanced By Exogenous Electrical Stimulation. *Journal of Neural Engineering*. 2019 IF = 4.810. Vol: 11, No. 4, (2014), pp. 046002. DOI:10.1088/1741-2560/11/4/046002.
 22. **Koppes, Abigail**, Nordberg*, Andrea, Paolillo*, Gina, Darwish*, Haley, Goodsell*, Nicole, and Thompson, Deanna. Electrical Stimulation of Schwann Cells Promotes Sustained Increases in Neurite Outgrowth. *Tissue Engineering A*. 2019 IF = 3.680. (2013). DOI:10.1089/ten.tea.2013.0012.
 23. Zorman, Christopher A., **Eldridge, Abigail N**, Du, John G, Johnston, Matthew J, Dubnisheva, Anna, Manley, Sean, Fissell, William, Fleischman, Aaron, and Roy. Shuvo. Amorphous silicon carbide as a non-biofouling structural material for biomedical microdevices. *Materials Science Forum*. IF = n/a. 717:537-540. (2012). DOI.org/10.4028/www.scientific.net/MSF.717-720.537.
 24. Behan*, Brenda, DeWitt, Daniel, Bogdanowicz*, Danielle, **Koppes, Abigail**, Bale, Shyam, Thompson, Deanna. Cytotoxicity of Single-Walled Carbon Nanotubes on Schwann Cells in 2D and 3D Microenvironments towards the Development of an Electrically Conductive Hydrogel for Neural Engineering. *Journal of Biomedical Materials Research Part A*. 2019 IF = 3.525. 96(1); 46-57. (2011). DOI: 10.1002/jbm.a.32939.
 25. **Koppes, Abigail N**, Seggio, Angela M, and Thompson, Deanna M. Neurite outgrowth is significantly increased by the simultaneous presentation of Schwann cells and moderate exogenous electric fields. *Journal of Neural Engineering*. 2019 IF = 4.810. Volume 8, Number 4. (2011). DOI: 10.1088/1741-2560/8/4/046023.
 26. Fissell, William H., Dubnisheva, Anna G., **Eldridge, Abigail N.**, Fleischman, Aaron J., Zydny, Andrew L., and Roy, Shuvo. High- Performance Silicon Nanopore Hemofiltration Membrane. *Membrane Science*. 2019 IF = 7.015. 326,1: 58-63. (2009). DOI:10.1016/j.memsci.2008.09.039.
 27. Fissell, William H., Manley, Sargum, Dubnisheva, Anna, Glass, Jeffrey, Magistrell, Jeffrey, **Eldridge, Abigail N.**, Fleischman, Aaron J., and Roy, Shuvo. Ficoll is not a rigid sphere. *American Journal of Physiology, Renal Physiol*. 2019 IF = 3.180. 293: F1209-F1213. (2007). DOI: 10.1152/ajprenal.00097.2007.

Publications in Review, Revision, or Preprint

1. Soucy, Jonathan R; Burchett, Gabriel*; Brady, Ryan*; Breault, David; **Koppes,**

Abigail; Koppes, Ryan. Innervated adrenomedullary microphysiological system to model prenatal nicotine and opioid exposure. *Advanced Biosystems, Minor Revision in review July 2020*.

2. Diaz Vera, David; Soucy, Jonathan; Cluff, Audrey*; Koppes, Ryan, **Koppes, Abigail**. Light irradiation of peripheral nerve cells: wavelength impacts primary sensory neuron outgrowth in vitro. *Journal of Photochemistry & Photobiology, B: Biology*. In review June 2020.

Book chapters

1. Biology and Engineering of Stem Cell Niches. *Chapter 37: Engineering the Niche for Intestinal Regeneration*. Victor Hernandez-Gordillo, **A. N. Koppes**, L. G. Griffith, D. T. Breault, R. L. Carrier. Edited by: Ajaykumar Vishwakarma and Jeffrey Karp. Academic Press (Massachusetts). (2018). DOI.org/10.1016/B978-0-12-802734-9.00037-8; ISBN: 978-0-12-802734-9.
2. Engineering Musculoskeletal Tissues and Interfaces. *Chapter 12: Neural Innervation of Engineered Musculoskeletal Tissues*. **A. N. Koppes** and D.M. Thompson. Edited by Syam Nukavarapu, Joseph W. Freeman, and Cato T. Laurencin; Taylor and Francis (New York). (2014). DOI.org/10.1016/B978-1-78242-301-0.00012-4.

Theses and dissertations

1. **Koppes, A. N.** (2013). *Application of physiologic electric fields to direct and enhance neurite outgrowth to assist in the treatment of peripheral nerve injuries*. Ph.D. Dissertation. Rensselaer Polytechnic Institute. ProQuest Dissertations Publishing. 3568270.

Patents and Disclosures

1. U.S. Provisional Application No.: 62/548,899; Filing Date: August 22, 2017. *Gelatin/Elastin Composites for Peripheral Nerve Repair*. Jonathan Soucy, Ehsan Shirzaei Sani, **Abigail Koppes**, Ryan Koppes, and Nasim Annabi.
2. U.S. Application No.: 16/120,198. *Fluidic Device and Method of Assembling Same*. Sanjin Husic, Jon Soucy, Shashi K. Murthy, Ryan A. Koppes, **Abigail N. Koppes**.
3. Invention Id: DISC-2019/014. *Transwell Millifluidic*. Submitted April 19, 2019. Eno Ebong, Ian Harding, Ira Herman, **Abigail Koppes**, Alex Caraballo.

Invited Lectures and Conference Plenaries

Scheduled

1. **Koppes, A.N.** (Aug 2021) *Tissue engineered platforms to study the enteric nervous system*. 2021 FASEB Summer Research Conference: Gastrointestinal Tract XIX, Steamboat Springs CO.
2. Diaz Vera, David; Soucy, Jonathan; Lee, Audrey; Koppes, Ryan, and **Koppes, Abigail**. Irradiation wavelength and duration impacts primary sensory neuron outgrowth in. Biomedical Engineering Society Annual Fall Meeting Neural Track, San Diego, CA. 2020.
3. **Koppes, A.N.** *Cholinergic activation of primary human derived intestinal epithelium does not ameliorate TNF- α induced injury*. Young Innovator Session, Biomedical Engineering Society Annual Fall Meeting Neural Track, San Diego, CA. 2020.
4. **Koppes, A.N.** (Rescheduled from Juneteenth, TBD 2020). Engineering the Enteric-Gut-Axis, Bioengineering Pre-Tenure Faculty e-Seminar Series. CRS Society hosted by Ankur Singh (GIT) and Greg Hudella (UFL)

5. **Koppes, A.N.** Organoids for in vitro models of the gut. Rensselaer Polytechnic Institute Stem Cell Core series. July 2020.

Presented

1. **Koppes, A.N.** (April 2020). *Tissue Engineering of the Gastrointestinal System*, UMass Lowell.
2. **Koppes, A. N.** (March 2020). *Engineered Models of the Gut-Brain-Axis*. UMass Amherst BME, Amherst, MA.
3. **Koppes, A.N.** (February 2020) *Engineered Enteric Systems*. Cygnal Therapeutics, Cambridge MA
4. **Koppes A.N.** (Feb 2020). *Brain-Gut Communication*. Strong Process Nutrition: Master Class Series. Lululemon x Strong Process. Boston.
5. **Koppes A.N., and Mills, C.,** Hua, Y., Lewis L.H., and Pérez del Real, R. (Dec 2019). *Directed Magnetostimulation for Nerve Regeneration Using Novel Microwires*. Instituto de Ciencia de Materiales de Madrid, CSIC. Madrid, Spain.
6. **Koppes, A.N.** (November 2019). *Rapid Prototyping of Multilayered, Thermoplastic, Patient-Derived Organs-on-Chips*. AICHE Annual 15d/e Lab, Organ Chip II Keynote. Orlando, FL.
7. **Koppes, A. N.** (October 2019). *Engineered Models of the Gut-Brain-Axis*. UMass Amherst, Amherst, MA.
8. **Koppes, A.N.** (October 2019) *Rapid Prototyping of Microphysiological Models of the Gut-Brain-Axis*. Science and Engineering Society Conference Symposium, Wash U St. Louis
9. **Koppes, A.N.** (May 2019) *Engineered Enteric Systems*. Merck Exploratory Science Center
10. **Koppes, A.N.** (April 2019). *Engineering biomaterials and stimuli for peripheral nerve regeneration*. Mass Eye and Ear/Harvard Medical School.
11. **Koppes, A. N.** (February 2019). *Engineered Models of the Gut-Brain-Axis*. Tufts University, Medford, MA.
12. **Koppes, A. N.** (November 2018). *Brain-Gut Communication*. Strong Process Forum. Boston, MA.
13. **Koppes, A. N.** (October 2018). *Engineering the Brain-Gut Axis*. American Institute of Chemical Engineers Women's Initiative Committee 20th Anniversary Symposium. Pittsburgh, PA.
14. **Koppes, A. N.** (2018). *Engineering Humanized Gut-Enteric Body Chips*. First International Conference on Biomaterials and Chemical Biology of Biomedical Engineering. Boston, MA.
15. **Koppes, A. N.** (2018). *Engineered Models of the Enteric-Gut Axis*. Johns Hopkins University Medical School, GI Core Center Seminar. Baltimore, MD.
16. **Koppes, A. N.** (2018). *Engineering Humanized Gut-Enteric Body Chips*. UMass Dartmouth Department of Biomedical Engineering. Dartmouth, MA.
17. **Koppes, A. N.** (2013). *Electrical Stimulation for Peripheral Nerve Repair*. Union College Department of Chemical Engineering. Schenectady, NY.

Conference Proceedings *Undergraduate, underline presenter, also published surname Eldridge

Podiums

1. Jonathan Soucy, Adam Bindas, Ryan Brady*, **Abigail Koppes**, Ryan Koppes. "GelPins: A New Strategy for Discrete Yet Cohesive Tissue Assemblies within 'Cut & Assemble' Organ-Chips." AICHE 2020, *Accepted Podium*.
2. Abigail Koppes, Ryan Koppes. 11th World Biomaterials Congress 2020. Glasgow UK. *Accepted Podium*.

3. Minhal Ahmed, Marissa Puzan, Ryo Hotta, Allan Goldstein, **Abigail Koppes**. "Gut-Brain-Axis on a Chip: Enteroendocrine Cells as Sensory Transducers in the Gut." Biomedical Engineering Society Annual Meeting, Philadelphia, 2019, *Podium*.
4. Jon Soucy, **Abigail Koppes**, Ryan Koppes. "Neuro-Cardiac Axis on a Chip: Neural Remodeling of the Cardiac Microenvironment." AICHE Annual Fall Meeting, Orlando, 2019, *Podium*.
5. Marissa Puzan, Sanjin Husic, Brooke Wojeski, Ryan Koppes, and **Abigail Koppes**; "Neuro-Epithelial Signaling in a Dish: Examining Diet-Induced Changes in Enteric Function", Biomedical Engineering Society Annual Meeting, Pittsburgh, 2018, *Podium*.
6. Minhal Ahmed*, Marissa Puzan, Ryo Hotta, Allan Goldstein, and **Abigail Koppes**; "Gut-Brain-Axis on a Chip: Enteroendocrine Cells as Sensory Transducers in the Gut." Biomedical Engineering Society Annual Meeting, Pittsburgh, 2018, *Podium*.
7. Sanjin Husic, Fanny Zhou, Will Lake, Marissa Puzan, David Breault, Ryan Koppes, Shashi Murthy, and **Abigail Koppes**, "Fab-free Rapid Prototyping of a Thermoplastic Patient-Derived Intestine-on-a-Chip", Biomedical Engineering Society Annual Meeting, Pittsburgh, 2018, *Podium*.
8. Jonathan Soucy, **Abigail Koppes**, Nasim Annabi, and Ryan Koppes, "Glial Cells Modulate Cardiac Beating: An In Vitro and In Silico Model", Biomedical Engineering Society Annual Meeting, Pittsburgh, 2018, *Podium*.
9. Jonathan Soucy, Tess Torregrosa, Sanjin Husic, Nasim Annabi, **Abigail Koppes** and Ryan Koppes; "Engineering a Physiologically Relevant Model of the Cardiac Autonomic Nervous System", American Institute of Chemical Engineers Annual Meeting, Atlanta, 2018, *Podium*.
10. Sanjin Husic, Marissa Puzan, Fanny Zhou, David Breault, Shashi Murthy, and **Abigail Koppes**, "Towards Rapid Prototyping of a Patient-Derived Gut-on-a-Chip", American Institute of Chemical Engineers Annual Meeting, Atlanta, 2018, *Podium*.
11. Sanjin Husic, Shashi Murthy, David Breault, and **Abigail Koppes**. "Rapid and Facile Fabrication Of Organs-on-Chips: Toward a Patient-Derived Intestine-On-A-Chip." BMES Annual Conference October 2017, Phoenix AZ. *Podium*
12. Tracy Carter, **Abigail Koppes**, Lucas J. Landherr, and Ronald J. Willey, "Aligning the Unit Operations Laboratory and the National Academy's Grand Challenges." AICHE Annual Conference November 2017, Minneapolis, MN. *Podium*
13. Daniel Ventre, Emily Ashbolt*, Marissa Puzan, and **Abigail Koppes**. "Acoustic Neuromodulation Enhances Peripheral Neurite Extension." BMES Annual Conference October 2017, Phoenix AZ. *Podium*
14. Jonathan Soucy, Ehsan Shirzaei Sani, David Diaz Vera, Roberto Portillo Lara, **Abigail Koppes**, Ryan Koppes, and Nasim Annabi. "Gelatin/Tropoelastin Hydrogel Composites for Peripheral Nerve Repair." BMES Annual Conference October 2017, Phoenix AZ. *Podium*
15. Jonathan Soucy, David Diaz Vera, Jody Askaryan*, **Abigail Koppes**, Nasim Annabi, and Ryan Koppes. "Development and Characterization of Micropatterned Cardiac Co-Cultures for Improved Tissue Engineering Strategies." BMES Annual Conference October 2017, Phoenix AZ. *Podium*
16. Minhal Ahmed*, Marissa Puzan, and **Abigail Koppes**. "Gut-Brain-Axis on a Chip: A Microfluidic Model of the Enteroendocrine-Enteric Interface." BMES Annual Conference October 2017, Phoenix AZ. *Podium*
17. Jonathan Soucy, Tess Torregrosa, **Abigail Koppes**, Nasim Annabi, and Ryan Koppes" An Optically Controlled Microphysiological System for the Heart-Brain Axis." AICHE Annual Conference November 2017, Minneapolis, MN. *Podium*
18. Alexis Ziemba, Anthony D'Amato, Devan Puhl, Taylor MacEwen*, **Abigail Koppes**, Ryan Gilbert, Michelle Lennartz, and Ryan Koppes. "IL-4-Releasing Films Shift Macrophages to an Anti-inflammatory State for Spinal Cord Injury Regeneration." BMES Annual Conference October 2017, Phoenix AZ. *Podium*

19. David Diaz Vera, Erin Cram, Ryan Koppes, and **Abigail Koppes**. “Enhancing Schwann Cell Proliferation Via Light Stimulation Using Visible Light: A Prelude to Peripheral Nerve Regeneration Using Optogenetics.” Biomedical Engineering Society Annual Fall Conference Minneapolis MN, 2016. *Podium*
20. Emily Ashbolt*, Marissa Puzan, Dan Ventre, **Abigail Koppes**. “Ultrasound Stimulation for Peripheral Nerve Repair.” Biomedical Engineering Society Annual Fall Conference Minneapolis MN, 2016. *Podium*
21. Jonathan Soucy, Ehsan Shirzaei Sani, David Diaz Vera, Roberto Portillo Lara, Suzanne Mithieux, Anthony Weiss, **Abigail Koppes**, Ryan Koppes, Nasim Annabi. “Engineering Gelatin/Tropoelastin Hydrogel Constructs for Neural Tissue Repair.” Materials Research Society Annual Fall Meeting, Boston, MA, 2016 *Podium*
22. **Abigail N. Koppes**, Kevin W. Keating*, Alexis L. McGregor*, Ryan A. Koppes, Christopher A. McKay, Jon M. Zuidema, Christopher J. Rivet, Ryan J. Gilbert, and Deanna M. Thompson. "Electrically Conductive Single-Walled Carbon Nanotube Composite Hydrogels for Peripheral Nerve Repair," Materials Research Society Annual Fall Meeting, Boston, MA, October 2013 *Podium*
23. **Abigail N. Koppes**, Kevin W. Keating*, Alexis L. McGregor*, Ryan A. Koppes, Christopher A. McKay, Jon M. Zuidema, Chris J. Rivet, Ryan J. Gilbert, and Deanna M. Thompson. "Conductive Single-Walled Carbon Nanotube-Composite Hydrogels for Neural Engineering Applications." Biomedical Engineering Society Annual Fall Meeting, Seattle, WA, September 2013. *Podium*
24. **Abigail N. Koppes**, Chris J. Rivet, Laura A. Williams*, Jenn M. Piselli*, Ryan A. Gilbert, and Deanna M Thompson. “Neurite Outgrowth On Electrospun PLLA Fibers Is Enhanced By Exogenous Electrical Stimulation”. Biomedical Engineering Society Annual Fall Meeting, Atlanta GA, October 2012. *Podium*
25. Chris Zorman, **Abigail Eldridge**, Jeff Du, Matt Johnson, Anna Dubnisheva, Sargum Manley, William Fissell, Aaron Fleischman, and Shuvo Roy. “Amorphous Silicon Carbide as a Non-Fouling Structural Material for Biomedical Microdevices.” International Conference on Silicon Carbide and Related Materials 2011. Published in: Materials Science Forum Vols. 717-720 pp 537-540, 2012. *Podium*
26. **Abigail N. Koppes** and Deanna M. Thompson “Single Electrical Stimulation of Schwann Cells Promotes Sustained Increases in Neurite Outgrowth.” Biomedical Engineering Society Annual Fall Meeting, Hartford, CT. October 2011. *Podium*
27. **Abigail N. Koppes** and Deanna M. Thompson. “Physiologically Compatible Electrical Stimulation of Schwann Cells Enhances Primary Neurite Outgrowth.” IEEE 37th Northeast Bioengineering Conference, Troy, NY. 2011. *Podium*
28. **Abigail N. Koppes**, Angela M. Seggio, Andrea Nordberg*, Gina Paolillo*, and Deanna Thompson. “Pre-treatment of Glia with DC Electrical Stimulation Increases Directional Neurite Outgrowth.” Biomedical Engineering Society Annual Fall Meeting, Austin, TX. October 2010. *Podium*
29. Shuvo Roy, Anna Dubnisheva, **Abigail N. Eldridge**, Aaron J. Fleischman, Katie Goldman, William Fissell. “Silicon Nanopore Membrane Technology for an Implantable Artificial Kidney.” Institute of Electrical and Electronics Engineers IEEE Proceedings of Transducers, Denver, CO. June 2009. *Podium*

Posters *undergraduate presenter

1. Jessica Thompson, Minhal Ahmed*, Adam Bindas, Ryan Koppes, **Abigail Koppes**. “Laser Cut and Assembly of Microphysiological Systems for the Gut-Brain-Axis.” 11th World Biomaterials Congress 2020. Glasgow UK. *Accepted Poster*.
2. Jessica Thompson, Jon Soucy, Sean Flannery*, Kathryn Bezold Lamm, Derrick Marshall, Ryan Koppes, Linda Griffith, **Abigail Koppes**. “Enteric nervous system cells encapsulated in hydrogels for intestinal tissue engineering.” 11th World Biomaterials Congress 2020. Glasgow UK. *Accepted Poster*.
3. Jon Soucy, Abigail Koppes, Ryan Koppes. “Engineering an Adrenal Organ-Chip

Model to Investigate Neurohormonal Control of Cardiac Output.” BMES Philadelphia, 2019, *Poster*.

1. Marissa Puzan, Eric Stas, Ryan Koppes, David Breault, Abigail Koppes. “Human Patient-Derived Models for Examining Neural and Epithelial Effects of Intestinal Inflammation.” BMES Philadelphia, 2019, *Poster*.
2. Abigail Koppes. “Microphysiological Models of the Gut-Brain Axis” Biomaterials GRC Spain, 2019.
3. Marissa Puzan and **Abigail Koppes**. “Enteric Neurons and Glia Contribute to Intestinal Inflammation and Epithelial Barrier Regulation through Pro- and Anti-Inflammatory Cytokine Release.” ENS 5th International Symposium, Boston, 2018, *Poster*.
4. J Soucy, D Diaz, **A Koppes**, N Annabi, R Koppes; “Schwann Cell Monolayers Naturally Enhance Cardiomyocyte Maturation” Society for Biomaterials, Atlanta, 2018, *Poster*.
5. Caroline Ghio*, Marissa Puzan, Andrew Ghio, and **Abigail Koppes**; “Iron Homeostasis in Intestinal Epithelial Cells”, Biomedical Engineering Society Annual Meeting, Pittsburgh, 2018, *Poster*.
6. Tess Torregrosa, Claire Duggan, Pedro Miguel Cruz, Julia Hechtman, Ann McDonald, Ibrahim Zeid, **Abigail Koppes**, and Ryan Koppes. “Piloting Art and Design Integration in Northeastern University’s Young Scholar’s Program”, Biomedical Engineering Society Annual Meeting, Pittsburgh, 2018, *Poster*.
7. Tess Torregrosa, **Abigail Koppes**, and Ryan Koppes. “Optogenetic Systematic Stimulation of the Autonomic Nervous System to the Heart In Vitro.” BMES Annual Conference October 2017, Phoenix AZ. *Poster*
8. Tess Torregrosa, Claire Duggan, Ryan Koppes, and **Abigail Koppes**, “Female Mentorship Before College: The Benefits of the Young Scholar’s Program”, Biomedical Engineering Society Annual Meeting, Pittsburgh, 2018, *Poster*.
9. Tess Torregrosa, **Abigail Koppes**, and Ryan Koppes. “Cryopreservation of Sympathetic and Parasympathetic Neurons for Autonomic Nervous System Culture.” BMES Annual Conference October 2017, Phoenix AZ. *Poster*
10. David Diaz Vera, Zoe Horton*, Audrey Lee*, Ryan Koppes, and **Abigail Koppes**. “Peripheral Nerve Regeneration via Optical Stimulation.” BMES Annual Conference October 2017, Phoenix AZ. *Poster*
11. Marissa Puzan, Ryan Koppes, Abigail Koppes. “Microelectrode Arrays for Rapid Screening of Metabolite Induced Electrophysiological Alterations in Primary Enteric Neurons.” BMES Annual Conference October 2017, Phoenix AZ. *Poster*
12. Marissa Puzan, Caroline Ghio*, David Breault, and **Abigail Koppes**. “Establishment of a Patient Biopsy-Derived Intestinal Model from Enteric Neural Stem Cells and Intestinal Epithelial Stem Cell.” BMES Annual Conference October 2017, Phoenix AZ. *Poster*
13. Sanjin Husic, Shashi Murthy, and **Abigail Koppes**. “Rapid and Facile Fabrication of Thermoplastic Organs-on-Chips.” AICHE Annual Conference November 2017, Minneapolis, MN. *Poster*
14. Marissa Puzan, Belete Legesse, Ryan Koppes, Hicham Fenniri, **Abigail Koppes**. “Rosette Nanotubes for Neural Tissue Engineering” Biomedical Engineering Society Annual Fall Conference Minneapolis MN, 2016. *Poster*
15. Marissa Puzan, **Abigail Koppes**. “Enteric Control of Intestinal Barrier Integrity” Biomedical Engineering Society Annual Fall Conference Minneapolis MN, 2016. *Poster*
16. Yang Lin*, David Diaz Vera, and **Abigail Koppes**. “Photostimulation of Microglia Indicates Cytotoxicity” Biomedical Engineering Society Annual Fall Conference Minneapolis MN, 2016. *Poster*
17. Joshua Scaralia, Madeleine Oudin, Miles Miller, Joydip Kundu, Rebecca Carrier, and **Abigail Koppes**. “Development of native retinal ECM hydrogels for increased cell

- viability during transplantation" Biomedical Engineering Society Annual Fall Conference Tampa FL, 2015. *Poster*
18. Marissa Puzan, Daniel Ventre, and **Abigail Koppes**. "Investigating Neural Control of Epithelial Barrier Function of the Small Intestine with an in Vitro Engineered Model System." American Institute of Chemical Engineers Annual Fall Conference (AIChE), Salt Lake City UT, 2015. *Poster*
 19. **Abigail Koppes**, Brian Montgomery, Megha Kamath, David Breault, Rebecca Carrier, "Biomimetic Topographical Replicas of Small Intestine For Regenerative Medicine and Drug Delivery Platforms," American Institute of Chemical Engineers Annual Fall Conference (AIChE), 2014. *Poster*
 20. Megha Kamath, **Abigail Koppes**, Rebecca Carrier, "Hydrogels Containing Biomimetic Topographical Features for Small Intestinal Model Systems" Materials Research Society Annual Fall Conference (MRS), 2014. *Poster*
 21. **Abigail N. Koppes**, Madeleine J. Oudin, Miles A. Miller, Peter Y. Baranov, Frank B. Gertler, Michael J. Young, Douglas A. Lauffenburger, Rebecca L. Carrier. "High-Throughput Screening for Directed Chemotaxis of Retinal Progenitor Cells in 3D Hydrogels " IEEE Northeast Bioengineering Conference, Boston, MA, April 2014. *Poster*
 22. Linxia Zhang, **Abigail N. Koppes**, and Deanna M. Thompson. "AC Electrically Stimulated Schwann Cells exerted Enhanced NGF Secretion and Promoted Neurite Outgrowth of Dorsal Root Ganglia Neurons." Biomedical Engineering Society Annual Fall Meeting, Seattle, Washington, September 2013. *Poster*
 23. **Abigail N. Koppes**, Kevin W. Keating, Nicole M. Goodsell, Gina R. Paolillo, Laura A. Williams, Haley M. Darwish, Deanna M. Thompson. "Exogenous Electrical Stimulation Promotes Unbiased, Robust Neurite Outgrowth and Non-Neural Cell Migration in 2D and 3D." 3rd Place, International Functional Electrical Stimulation Society, Banff, AB, Canada. September 2012. *Poster*
 24. **Abigail N. Koppes**, Kevin W. Keating, Gina R. Paolillo, Haley M Darwish, Nicole M Goodsell, Laura A. Williams, Deanna M. Thompson. "Electrical Stimulation Increases Neurite Outgrowth and Cell Galvanotaxis Within 3D Hydrogels." Biomedical Engineering Society Annual Fall Meeting, Atlanta, GA, October 2012. *Poster*
 25. Kevin W. Keating*, Alexis L McGregor*, **Abigail N Koppes**, Deanna M. Thompson, "The Effects of Single-Walled Carbon Nanotube Exposure on Dorsal Root Ganglia Outgrowth in Three-dimensional Collagen Scaffolds." Biomedical Engineering Society Annual Fall Meeting, Hartford, CT. October 2011. *Poster*
 26. **Abigail N. Koppes** and Deanna M. Thompson "Single Electrical Stimulation of Schwann Cells Promotes Sustained Increases in Neurite Outgrowth." Biomedical Engineering Society Annual Fall Meeting, Hartford, CT. October 2011. Also, Top Poster, RPI NIH Training Grant Retreat in September 2011. *Poster*
 27. **Abigail N. Koppes**, Gina Paolillo*, Haley Darwish*, Izabella Palazzo**, Deanna M. Thompson "Non-neural Cell Migration and Phenotype is Enhanced Following Exogenous Electrical Stimulation," Society for Neuroscience Annual Meeting, Washington, DC. November 2011. *Poster*
 28. **Abigail N. Eldridge**, Courtney M. Dumont, Gurtej Singh, Vanessa D. Alphonse*, Pankaj Karande, Deanna Thompson, "Development of a High Throughput Screen to Create an Optimized Biomaterial for Peripheral Nerve Injury." Society for Biomaterials Annual Meeting, Seattle, WA, April 2010. *Poster*
 29. **Abigail N. Eldridge** and Deanna Thompson "Co-Stimulation of Neurons with Physiologic Electric Fields and Schwann Cells Additively Increases Neurite Outgrowth" Society for Biomaterials Annual Meeting, Seattle WA. April 2010. *Poster*
 30. **Abigail N. Eldridge** and Deanna Thompson. "Applied Physiologic Electric Fields Orient Primary Neonatal Rat Schwann Cells" Biomedical Engineering Society Annual Fall Meeting, Pittsburg, PA. October 2009. *Poster*

31. **Abigail N. Eldridge** and Deanna Thompson, “Alignment of Primary Neonatal Rat Schwann Cells in Applied Electric Fields” Society for Neuroscience Annual Meeting, Chicago, IL. October 2009. *Poster*
32. **Abigail N. Eldridge**, Anna Dubnisheva, William Fissell, Aaron Fleischman, Shuvo Roy, “Increased Biocompatibility of Common MEMS Substrates with Solution Phase Coupled Poly(ethylene glycol) Films.” ASME Summer Bioengineering Conference Student Paper Competition, Keystone, CO. June 2007 1st Place. *Poster*
33. **Abigail N. Eldridge**, Anna Dubnisheva, William H. Fissell, Aaron J. Fleishman, and Shuvo Roy, “Solution-Phase Coupled Poly(ethylene glycol) Films Reduce Protein Fouling and Thrombogenicity of Common MEMS Substrates.” American Society for Nephrology Annual Conference Renal Week, San Francisco, CA. October 2007. *Poster*
34. **Abigail N. Eldridge**, Chris A. Zorman, Anna G. Dubnisheva, William H. Fissell, Aaron J. Fleischman, Shuvo Roy. “Characterization of Poly(ethylene glycol) Films on Silicon Carbide for Biomedical Microdevices.” Biomedical Engineering Society Annual Fall Meeting, Los Angeles, CA. September 2007. *Poster*

Proceedings Pending *undergraduate presenter

1. Jonathan Soucy, **Abigail Koppes**, Ryan Koppes. “Utility of an innervated adrenomedullary microphysiological system for investigating the role of the nervous system and drugs of abuse.” In review, BMES 2020.
2. Caroline Ghio*, Joleen M. Soukup, Lisa Dailey, Andrew Ghio, and **Abigail Koppes**. “Lactate Production Can Function to Increase Intracellular Iron Concentration.” In review, BMES 2020.
3. Xiaoyu Zhang, Caroline Mills*, Yinying Hua, Ryan Koppes, Rafael Pérez del Real, Manuel Vázquez Villalabeitia, **Abigail Koppes**, Laura Lewis. “Towards next-generation nerve repair: using amorphous ferromagnetic microwires to promote nerve regeneration.” In review, MRS 2020.
4. Xiaoyu Zhang, Caroline Mills*, Yinying Hua, Ryan Koppes, Rafael Pérez del Real, Manuel Vázquez Villalabeitia, **Abigail Koppes**, Laura Lewis. “Towards next-generation nerve repair: effects of static magnetic field on neurite extensions.” In review, 2020 MMM Conference.

Grants and Research Support

External Current Research Support

1. **NIH 1R21EB025395-01**. *Trailblazer: Engineering a Humanized Gut-Enteric Axis*. Role: PI Abigail Koppes, mPI Ryan Koppes. Award Period: 12/1/2017 - 11/30/2020. \$200,000 DC (50%) (\$628,000.00 total) https://projectreporter.nih.gov/project_info_description.cfm?aid=9816632
2. **NIH 1R01EB021908-02**. *GUMI: New in Vitro Platforms to Parse the Human Gut-Epithelial-Microbiome-Immune Axis*. Role: Co-I. PI Rebecca Carrier, mPI Linda Griffith Award Period: 8/1/2016 - 4/30/2021. \$184,991.71 DC (15%) (\$6,248,266 total) https://projectreporter.nih.gov/project_info_description.cfm?aid=9923719
3. **AHA Innovative Project Award**. *Bioengineer autonomic neurovascular system to explore the innervation of vascular grafts*. Role: Co-I (Dai, Koppes, Koppes) Award Period: 9/1/2019-8/31/21. \$50,000 DC (25%)(\$200,000 total). [https://puresearch.americanheart.org/en/awards/bioengineer-autonomic-neurovascular-system-to-explore-the-innervation-of-vascular-grafts\(71c0ce93-ba1e-427f-badf-a8896ce9944e\).html](https://puresearch.americanheart.org/en/awards/bioengineer-autonomic-neurovascular-system-to-explore-the-innervation-of-vascular-grafts(71c0ce93-ba1e-427f-badf-a8896ce9944e).html)

External Pending Research Support

1. NIH NIDDK R01. *A Bioengineered Microphysiological System for Screening Interactions in the Epithelial-Enteric Niche*. PI. \$3,299,471.8 (75%).
2. NIH NINDS R21. *Bioengineer a humanized Autonomic Neurovascular Innervation on a Chip*. (Koppes, Dai). Co-I. \$431,750 (20%).
3. NIH NIA R21. *Developing a microphysiological system of a humanized Gut-Brain-Axis for age-associated transmissible neuropathologies*. mPI (Koppes, Kulkarni). Co-I. \$215,875 subcontract (50%).
4. NSF CAREER CBET. *CAREER: Defining the regulators of enteric plasticity in engineered microfluidic environments*. PI. \$500,000 (100%). In submission.

Select External Research Support Not Funded

1. 2019 NIH R01 MGH. *Defining the Role of Enteroendocrine-Enteric Relays in Dysmotility in a Microphysiological System*. PI. \$1,044,880 (75%), (Scored, unfunded)
2. 2019 NIH R35 MIRA. *Defining the mechanisms of cellular dynamics and regeneration in the periphery*. PI. Total \$1,930,339 (100%).
3. 2019 LOI DOD Discovery Award 2019. *Light-activated nerve glue for suture-less repair*. Role: Co-I. \$200,000 (50%). (Scored, unfunded.)
4. 2019 NIH NIBIB R21. *Bioengineer a neurovascular system on a chip to explore the innervation of arterial grafts*. Role Co-I (Koppes, Dai). \$431,750 requested (20%). (Scored, unfunded)
5. 2019 NIH NCATS HEAL UG2/UH3. *A humanized microphysiological system of the ascending visceral pain pathway*. Role: PI (Koppes, Pasricha JHU). \$3,999,343 (50%) Scored, unfunded.
6. 2018. Chen Zuckerberg Initiative, Silicon Valley Community Foundation (SLVCF) Neurodegeneration Challenge. *Microphysiological Systems for Discovery in the Brain-Gut-Axis*. Role: PI. \$2,500,000 DC.
7. 2018. National Science Foundation (NSF) CBET, *CAREER: Engineering the Gastroenteric Niche to Support Epithelial Barrier Regulation*. Role: PI \$533,286
8. 2018. National Science Foundation Research Traineeship (NRT) Program. *NRT-UtB: Understanding How Brain Creates Mind: Educating the Missing Link*. Role co-PI. \$2,999,520.33 requested. *recommended, unfunded.
9. 2015 Beckman Foundation Young Investigator Award. *Controlling Glial Phenotype via Targeted Biophysical Stimulation for Improved Neuronal Regeneration*. Role PI. \$749,281 requested. 2nd round, unfunded.

Internal Completed Research Support

1. 2016 Tier 1 Research Grant. *Biomanufactured Nerve Guidance Channels for Complex Nerve Repair*. Role: PI. Co-PIs Ekenseair and Cram
Award Period: 6/1/2016 - 12/31/2017. \$50,000 (33%)
2. 2014 NSF ADVANCE STEM Fellow. NSF ADVANCE Future Faculty Fellowship.
Award Period: Award Period 05/15/2014-08/28/2014. Role: Fellow \$50,000/yr (100%)

Teaching and Advising

New Course Development

1. *CHME 5185 Design and Experiments of Ethical Research (DOOER)*.
The practice of engineering and scientific research with integrity. This course involves the awareness and application of professional norms and ethical principles in the

performance of activities related to scientific research, statistics, science communication, and the design of experiments. 4 credits. Fall annually.

2. CHME 3315/3316 *Chemical Engineering Design Lab 1 and Recitation*
Unit operations laboratory (Transport 1 lab) 4 credit from prior 2 credit course, development of additional 1 hour lecture period and design modules. Including safety, statistics, design of experiments, computational analysis, data presentation and visualization, scientific writing, materials science, macro to microfluidics, and other contemporary issues. Spring annually.

Courses Taught

Semester	Course Number	Course Title	Enrollment	Instructor Effectiveness ^y	Student Learning
Fall 2014	CHME 2331	Unit Operations Lab	11	4.1 (n/a, n/a)	4.3 (n/a, n/a)
Spring 2015	CHME 2331	Unit Operations Lab	10	4.6 (n/a, n/a)	4.8 (n/a, n/a)
Fall 2015	CHME 2331	Unit Operations Lab	15	4.6 (4.2, 4.3)	4.4 (4.2, 4.2)
Fall 2016	CHME 2331	Unit Operations Lab	19	4.8 (4.3, 4.3)	4.6 (4.0, 4.1)
Spring 2017	CHME 2331	Unit Operations Lab	19	4.6 (4.2, 4.4)	4.8 (4.2, 4.2)
Fall 2017	CHME 2331	Unit Operations Lab	17	4.6 (4.4, 4.4)	4.6 (4.3, 4.3)
Spring 2018	CHME 2331	Unit Operations Lab	19	4.8 (4.0, 4.4)	4.4 (4.1, 4.3)
Fall 2018	CHME 5185	MIRER (RCR)	6	5.0 (4.3, 4.4)	4.8 (4.3, 4.3)
Spring 2019	CHME 3315/6	Design 1 (UO lab)	12	4.8 (4.3, 4.3)	4.3 (4.3, 4.3)
Fall 2019	CHME 5185	DOEER (RCR)	11	5.0 (4.4, 4.4)	4.6 (4.3, 4.3)

^y "What is your overall rating of this instructor's teaching effectiveness?" Almost always effective = 5, Never Effective = 1

^z "I learned a lot in this course." Strongly agree = 5, Strongly disagree = 1

(Numbers in parentheses show ChmE department and University mean scores: (ChmE, NU))

Teaching Assistant

2010	Intro to Cell and Molecular Biology Lab	Rensselaer Polytechnic Institute
2009	Human Physiological Systems	Rensselaer Polytechnic Institute
2009	BioMEMs	Rensselaer Polytechnic Institute
2009	Biomaterials Science and Engineering	Rensselaer Polytechnic Institute
2008	Senior Biomedical Engr Lab (MVP TA)	Rensselaer Polytechnic Institute

Graduate Supervision *Graduated

2019	Kirstie Belanger Title: <i>Innervated Cardiac MPS</i>	Ph.D. Candidate '24 Northeastern University
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2019	Kyla Nichols	Ph.D. Candidate '24	Northeastern University
	Title: <i>Instrumented MPS for understanding pain networks</i>		
2018	Adam Bindas	Ph.D. Candidate '23	Northeastern University
	Title: <i>Enteric-Neural Interactions on MPS</i>		
2018	Jessica Thompson	Ph.D. Candidate '23	Northeastern University
	Title: <i>Enteroendocrine-Enteric Communication Networks</i>		
2015-	David Diaz Vera	Ph.D. Candidate '20	Northeastern University
	Title: <i>Optogenetic Control of Glial Cells for Nerve Regeneration</i>		
2018-20	Caroline Mills*,	M.S. '20	Northeastern University
	Title: <i>Using Magnetic and Topographical Cues to Influence the Growth of Neuron Extensions</i>		
2015-20	Tess Torregrosa*,	Ph.D. '20	Northeastern University
	Title: <i>The Systematic Study of an In Vitro Model of Autonomic Nervous System to the Heart and it's Communication and Education (Co-advisor Ryan Koppes)</i>		
	Current Position: Biogen		
2014-19	Daniel Ventre*,	Ph.D. '18	Northeastern University
	Title: <i>Ultrasonic Neuromodulation for Electroceutical Applications</i>		
	Current Position: MIT Tech Transfer Office		
2014-19	Sanjin Husic*,	Ph.D.	Northeastern University
	Title: <i>Laser Cut and Assembled Microfluidic Organ-Chips</i>		
	Current Position: BlueBird Bio		
2014-18	Marissa Puzan*,	Ph.D.	Northeastern University
	Title: <i>Engineering the Brain in the Gut: A 3D Model of the Enteric Nervous System</i>		
	Current Position: Pfizer		
2014-16	Megha Kamath*,	MS	Northeastern University
	Title: <i>Biomimetic Replicas for Engineered Small Intestine to Improve Drug Delivery Models (co-advisor, R. Carrier)</i>		
	Current Position: Research Consultant at the NIH		
2014-15	Joshua Scaralia*,	MS	Northeastern University
	Project: <i>High-throughput Screening of Biomaterials for Retinal Progenitor Cell Delivery Vehicles (co-advisor R. Carrier)</i>		
	Current Position: Engineer I at Azzur Group Boston		

Graduate Thesis Committee Memberships:

Student Name	Type of Research	Graduation Date	Thesis Title and Advisor
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Joshua Luchan	Bioengineering	2020	“TBD” Advisor: Rebecca Carrier
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Andrew Zorn	Neuroscience	2022	“GIRK Channels in Neuropathies”
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			Advisor: Leigh Plantt
Will Le	Neuro Cancer	2022	“Innervation of Cancer Models” Advisor: Madeleine Oudin (Tufts)
Yi Qiang	Electronics	2020	“Flexible and scalable electronics” Advisor: Hui Fang
Jonathan Soucy	Microfluidics	2020	“In Vitro Models of the Cardiac Neuromuscular-Hormonal Axis” Advisor: Ryan Koppes
Max Winkelman	Microfluidics	2020	“Engineering the Blood-Brain Barrier” Advisor: Guohao Dai
Ece Alpaslan	Nanotechnology	2020	“Cerium Oxide Nanoparticles as a Novel Nanodrug” Advisor: Thomas Webster
Aida López Ruiz	Nanotechnology	2020	“Synthesis of silver palladium and Silver platinum nanoparticles as antimicrobial and anticancer agents” Advisor: Thomas Webster
Wei Wu	Stem Cell Biology	2020	“Triblock copolymers of PLLA-PEG-PLLA for nerve guidance channel scaffolds via 3D printing” Advisor: Adam Ekenseair
Paige Baldwin	Nanotherapeutics	2019	“ <i>NanoDinaciclib</i> ” Advisor: Sridhar, Srinivas
Ebi Mostafavi	Cardiac Patches	2020	“ <i>A Conductive Nanostructured Epicardial Patch for Cardiac Repair</i> ” Advisor: Thomas Webster
Alisha Truman	Stem Cell Biology	2019	“In vitro derived granulosa cells as a Mechanism for hormonal rejuvenation and folliculogenesis” Advisor: Dori Woods ** Graduated
Gino Karlo De Reyas	Nanotechnology	2018	“ <i>Rosette Nanotube Mediated RNA Delivery</i> ” Advisor: Hicham Fenniri
Bailey Warner	Genetic Engineering	2018	“Engineering the expression of GOLDEN transcription factor in <i>Catharanthus roseus</i> hairy root cultures” Advisor: Carolyn Lee-Parsons **
Will Collins	Biomaterials	2018	“Functional Effects of a Neuromelanin Analog on Dopaminergic Neurons in 3D Cell Culture: Biomaterials for Modeling Neurodegenerative Disease”

			Advisor: David Kaplan (Tufts)
Adedokun Adedoyin	Biomaterials	2018	“Bionanocomposite scaffolds for osteochondral tissue regeneration” Advisor: Adam Ekenseair
Jennifer Morales	Biosensors	2018	“Opto-electric networks for GABA-Mediated downstream signaling” Advisor: Heather Clark
Run “Kanny” Chang	Nanomaterials	2018	“Self-assembled amphiphilic nanofibers for medical applications” Advisor: Thomas Webster
Meryem Pehlivaner	Biomaterials	2018	“Minimally Invasive Therapies for Treatment of Inflammatory Bowel Disease via In Situ Spray Deposition of Thermoresponsive Hydrogels.” Advisor: Adam Ekenseair
Michelle Stolzoff	Nanomaterials	2017	“Self-assembled amphiphilic nanofibers for medical applications” Advisor: Thomas Webster

Postdoctoral Supervision

2018-2019 Christopher Bertucci* Northeastern University
 Project: *Sutureless repair of peripheral nerves via photocrosslinkable Adhesives.* (co-advisor R. Koppes).
 Current position: Regeneron

Undergraduate Supervision

Student Name	Type of Project*	Graduation Class	Project Title
1. Giselle Martinez	Co-Op	2023	“Microfabrication of Brain Slice Fluidics”
2. Angelina Pizzo	Research	2020	“Biomaterials for Epithelial Engineering”
3. Ben Carter	Research	2023	“Enteric engineering”
4. Rithika Pradeep	Indp Study	2022	“Neural stem cell Engineering”
5. Justin Mudryk	Research	2022	“Optogenetics for Nerve Repair”
6. Sean Flannery	Research	2022	“Enteric Stem Cells”
7. Molly Wheeler	Research	2022	“Neural Stem Cells
8. Bridie Eckel	Research/Provost	2022	“Amyotrophic Lateral Sclerosis:

				Determining a Linkage Between Astrocyte Phenotype and the Progression of Motor Neuron Deterioration in ALS”
9.	Orion Wilmerding	Research/Provost	2020	“Electrophysiology of neural circuits” Co-advised Ryan Koppes
10.	Joyce Wong	Research	2022	“Microfluidic Fabrication of Organ Chips”
11.	Jack Gelinias	Research	2022	“Ultrasonic Neuromodulation”
12.	Ulpiano Flores Kuri	Research	2021	“Genetic Engineering for Nerve Repair”
13.	Christian Gagnon	Research <i>Current Position: Voyager Therapeutics</i>	2020	“Neural Imaging Processing”
14.	Matthew Schwartz Neurons”	Research	2021	“NeuroLucida Tracing of
15.	Beth DiBiase	Research/Provost	2021	“Culture and Differentiation of Epithelial Organoids”
16.	Caroline Ghio	Research/Provost	2021	“Identification of Enteric Neurons”
17.	Cole Hindman	Research	2021	“Optogenetic Control of Microglia”
18.	Taylor Lynch	Research	2021	“Enteric Neural Stem Cell Differentiation”
19.	Owen Porth	Research <i>Current Position: accepted PhD candidate MIT</i>	2020	“Genetic Engineering for Nerve Repair”
20.	Gabe Burchett	Research/Ind/ Provost	2020	“Microfluidic Models of the ANS”
21.	Audrey Lee	Research	2020	“Optogenetics for peripheral nerve repair”
22.	Amelia Heeson	Research	2020	“Triculture models for autonomic modeling”
23.	Avery Cluff	Research	2021	“Ultrasonic Neuromodulation”
24.	Nicole Marco	Research	2020	“Microfluidic Brain-Gut-on-Chips”
25.	Ulpiano Flores Kuri	Research	2020	“Optogenetics for nerve repair”

26. Brooke Wojeski Research 2019 “Neural Electrophysiology”
Current Position: Associate Electrochemical Engineer at Form Energy, Inc.
27. Will Lake Research/Ind 2019 “Microfluidic Brain-Gut-on-Chips”
Current Position: Engineer I at CRISPR Therapeutics
28. Nicholas Phelen Research/Honors 2019 “Engineering the brain-in-the-gut”
Current Position: Product Engineer at Bio-Techne
29. Mina Iskarous Research/Honors 2019 “Ultrasonic Neuromodulation: technology”
Current Position: Dorm Room Fund scientific investments
30. Vasco Correia Diogo Research 2019 “Ultrasonic Neuromodulation: biology”
31. William Cisneros Research 2019 “High throughput retinal cell migration”
Current Position: Ph.D. candidate Biomedical Sciences at Northwestern
32. Minhal Ahmed Research/Honors/Provost 2019 “Brain-gut interfacing”
Winner of Goldwater Fellowship 2018, Honorable Mention 2017
Winner of Mitchell Fellowship 2019 – Cork Ireland Cryan Lab M.S.
33. Alon Duval Research 2019 “Statistical Analysis of Schwann Cell Phenotype in Ultrasonic Stimulation”
34. Yang Lin Research/Provost 2018 “Influence of Microglia Mediated Neuroinflammation on Neuronal Apoptosis”
Current Position: Mass Gen Hospital
35. David Urick Research/Provost 2018 “Neuronal Regeneration in the Presence of Cytotoxic CD8+ T-Lymphocytes”
Current Position: Mass Gen Hospital
36. Emily Ashbolt Research/Provost 2017 “Ultrasonic impact on neurite growth”
Current Position: Attending for Ph.D. in BioE Stevens Institute of Technology
37. Rachel Shapiro Research/Honors 2017 “Differentiation of Neural Progenitors”
Current Position: Attending for Ph.D. in BioE Johns Hopkins

*research project/honors project/independent study

Undergraduate Advising Activities

- Academic advisor for ~20 students each semester since 2014, as part of the Department of Chemical Engineering undergraduate advising program, meeting advisees at least once per semester with occasional follow-up meetings as necessary.
- Frequently serve on career discussion panels organized by the GWISE student group.
- ISPE student co-advisor with Carolyn Lee-Parsons, group was awarded national award 2017

Selected Honors and Awards Since 2013

- 2020 Young Innovator in Cellular and Molecular Bioengineering, Journal of the Biomedical Engineering Society
- 2018 Young Investigator Award, First International Conference on Biomaterials and Chemical Biology, Boston, MA
- 2013-14 Northeastern University NSF ADVANCE STEM Future Faculty Postdoctoral Fellow, Boston, MA
- 2013 Zelda and David G. Gisser Prize for outstanding dissertation in Biomedical Engineering, Rensselaer Polytechnic Institute

Service & Professional Development

Service to the Department of Chemical Engineering

- Graduate Committee, Fellowships 2014-
- Faculty Search Committee 2016
- Undergraduate recruiting and outreach: presented annually at weekend Open House and Welcome Days for prospective students and their parents 2014-2018
- Graduate student recruiting annually

Service to the College of Engineering

- Scholars welcome day 2016-2018
- BioE qualifying examiner 2020
- BioE hiring committee 2016
- Graduation Ceremony Marshal 2015-2019
- STRIDE Interviewing panel 2016
- ADVANCE mentoring of new faculty prospects including email correspondence and meetups 2014-present
- Invited NIH NIBIB PO to give a seminar on applying to NIH/NIBIB
- Judge for RISE 2018-19

Service to the University

- Organizer of NEBEC 2014
- De-facto manager of new six-PI shared Spark Lab 2015-2019 spring
- Biology hiring committee 2019-2020

Service to the Discipline

Leadership

- BMES Diversity Committee 2020-2023

Conference Organizing

- BMES: Elected **Track Chair** (with Stephanie Seidlits UCLA) Neural Engineering 2018
- AIChE: Elected **Area Chair** 2019, Vice-Chair 15D/E 2018
- AIChE: Elected WIC Fall programming committee 2016, 2017
- NEBEC: conference organizer at Northeastern 2014

Session Chairing

- BMES: Sub-Track Chair: Neuromodulation and Connectivity 2019
- BMES: Sub-Track Chair: Neural Cell Model Systems 2016-2017
- BMES: Sub-Track Chair: Stem Cell Engineering (Neuro) 2017
- AIChE: Track Chair: 8b, graduate awards, and 15d cells, systems, and body on-chip 2016-
- AIChE: WIC programming committee 2015-2017
- SfB: Session Chair, Neural Engineering 2016

Reviewing, Judging, Examining

- BMES: Abstract Reviewer 2014-2017: Micro and Nano Technologies, Neural Engineering, Stem Cell Engineering, Glial Cell Engineering
- SfB: Abstract reviewer Neural Engineering 2017-2018
- Editorial Board, Cells Tissues Organs (Karger)
- Burroughs Wellcome Fund invited workshop participation at Boston Consulting Group 2019

Select Journal Paper Reviews 2017-2020

- Biomaterials
- Tissue Engineering A
- Journal of Neural Engineering
- Acta Biomaterialia
- Scientific Reports
- Biofabrication
- Brain Stimulation
- Lab-on-a-Chip
- Analytical Chemistry
- Advanced Biosystems
- PNAS
- ACS Biomaterials Science and Engineering
- SMALL

Ad Hoc Reviewer

- Dept of Defense CDMRP / PRMRP
- NIH SPARC
- NIH NIGMS
- NSF CBET
- NIH NIDDK SEP-DKUS T90
- NRSEC Collaborative Research Grant reviewer (Canada)

Service to the Broader Community

- Featured Scientist on *NPR WHYY* The Pulse Podcast 9/13/19
[https://www.npr.org/podcasts/381443461/the-pulse; "Gut Feeling"](https://www.npr.org/podcasts/381443461/the-pulse;GutFeeling)

- *Engineering Crash Course*: YouTube. Contributed to episodes: #36, 37, and 38 https://www.youtube.com/playlist?list=PL8dPuuaLjXtO4A_tL6DLZRotxEb114cMR
- Commentary in *Science Magazine* on bioelectricity and cell migration: www.sciencemag.org/news/2020/01/watch-scientists-use-electricity-herd-skin-cells-sheep
- *Young Scholars Summer Immersion* in research: Hosted three juniors through an immersion summer research program 2017-2019. Best poster awarded at jamboree 2017. <https://stem.neu.edu/summer/ysp/>
 - 3 graduated women from 2017 have entered BS at Harvard and Northeastern respectively
 - 1 graduated man from 2019 has entered Vanderbilt for Bioengineering
- *Building Bridges* "Microscopy U": hosted junior girls in my lab for a workshop on microscopy. <https://stem.neu.edu/programs/ayp/building-bridges/> 2017, 2019
- Chemical Engineering graduate student Tess Torregrosa awarded \$2k from the National Science Foundation to travel to the Doctoral Consortium at the 2017 International Conference on Mobile Brain-Body Imaging (MoBI) and the Neuroscience of Art, Innovation, and Creativity in Valencia, Spain 2017. https://nsf.gov/awardsearch/showAward?AWD_ID=1745835
- NEU High School Science Fair Judge 2014
- Changing the World Through Stem: Teen Career Expo, 2014
- Hosted Northeastern University Chemical Engineering Booth including hands-on demonstrations for 150+ 6-12th grade girls in collaboration with the National Girls Collaborative Project and The Girl Scouts of Eastern Massachusetts.
- Wellesley High School STEM Event to help talk to high school students about STEM and college 2014
- Organized Field Day "How Sweet: Glass Transition and Liquid Nitrogen Ice Cream" for 25 6-8th graders from the Timilty School at Roxbury Crossing 2014

