CURRICULUM VITAE – **Jonathan A. Kopechek, Ph.D.**

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Education

2011 Ph.D., Biomedical Engineering, University of Cincinnati
2006 B.S., Electrical & Computer Engineering, The Ohio State University
Graduated Cum Laude with Honors and Distinction

Professional Appointments

2016 – present	Assistant Professor, Dept. of Bioengineering, University of Louisville
2018 – present	Associate Appointment in Dept. of Medicine, University of Louisville
2015 – 2016	Ruth L. Kirschstein NRSA Postdoctoral Fellow, Dept. of Medicine, University of Pittsburgh
2013 – 2014	Postdoctoral Associate, Heart and Vascular Institute, Dept. of Medicine, University of Pittsburgh
2012 – 2013	Postdoctoral Fellow, Training in Nanotechnology for Cancer Program Colleges of Medicine and Engineering, Boston University
2011 – 2013	Postdoctoral Associate, Dept. of Mechanical Engineering, College of Engineering, Boston University
2011 – 2013	Sponsored Staff, Dept. of Radiology, Brigham and Women's Hospital, Harvard Medical School
2009 – 2010	Editorial Assistant, Ultrasound in Medicine and Biology
2006 – 2011	Graduate Research Assistant, Dept. of Biomedical Engineering, Colleges of Medicine and Engineering, University of Cincinnati
2006 – 2008	Graduate Teaching Assistant, Dept. of Biomedical Engineering Colleges of Medicine and Engineering, University of Cincinnati
2005 – 2006	Research Intern, Engineering Experiment Station College of Engineering, The Ohio State University
2004	Validation Intern, Intel Corporation

Peer-Reviewed Publications *(Google Scholar h-index: 18)*

(*[*]indicates co-first author, [#]indicates co-senior author, underline indicates mentored student)*

1. Murphy EM, Centner CS, Bates PJ, Malik MT[#], **Kopechek JA**[#]. "Delivery of thymoquinone to cancer cells with as1411-conjugated nanodroplets," PLoS One 15:e0233466 (2020).
2. Centner CS[*], Murphy EM[*], Priddy MC, Moore JT, Janis BR, Menze MA, DeFilippis AP, **Kopechek JA**. "Ultrasound-induced molecular delivery to erythrocytes using a microfluidic system," *Biomicrofluidics* 14:024114 (2020). *Selected as "Editor's Pick" and featured on journal homepage.*
3. **Kopechek JA**, McTiernan CF, Chen X, Zhu J, Mburu M, Feroze R, Whitehurst DA, Lavery L, Cyriac J, Villanueva FS. "Ultrasound and Microbubble-targeted Delivery of a microRNA Inhibitor to the Heart Suppresses Cardiac Hypertrophy and Preserves Cardiac Function," *Theranostics*, 9:7088-7098 (2019).
4. Bhutto DF, Murphy EM, Priddy MC, Centner CC, Moore JB, Bolli R, **Kopechek JA**. "Effect of Molecular Weight on Sonoporation-Mediated Uptake in Human Cells," *Ultrasound Med. Biol*, 44:2662-2672 (2018).
5. **Kopechek JA**[*], Carson AR[*], McTiernan CF, Chen X, Klein EC, Villanueva FS. "Cardiac Gene Expression Knockdown Using Small Inhibitory RNA-Loaded Microbubbles and Ultrasound," *PLoS One*, 11: e0159751 (2016).
6. **Kopechek JA**[*], Carson AR[*], McTiernan CF, Chen X, Hasjim B, Lavery L, Sen M, Grandis JR, Villanueva FS. "Ultrasound Targeted Microbubble Destruction-Mediated Delivery of a Transcription Factor Decoy Inhibits STAT3 Signaling and Tumor Growth," *Theranostics*, 5:1378-1387 (2015).
7. **Kopechek JA**, Park EJ, Zhang YZ, Vykhodtseva NI, McDannold NJ, Porter TM, "Cavitation-enhanced MR-guided focused ultrasound ablation of rabbit tumors in vivo using phase shift nanoemulsions," *Physics in Medicine and Biology*, 59:3465-3481 (2014).
8. Duncanson WJ, Arriaga LR, Ung L, **Kopechek JA**, Porter T, Weitz DA. "Microfluidic Fabrication of Perfluorohexane-Shelled Double Emulsions for Controlled Loading and Acoustic-Triggered Release of Hydrophilic Agents," *Langmuir* 30:13765-13770 (2014).
9. Parrales MA, Fernandez JM, Perez-Saborid M, **Kopechek JA**, Porter TM, "Acoustic characterization of monodisperse lipid-coated microbubbles: relationship between size and shell viscoelastic properties," *Journal of the Acoustical Society of America*, 136:1077-1084 (2014).
10. **Kopechek JA**, Park EJ, Mei CS, McDannold NJ, Porter TM, "Accumulation of phase-shift nanoemulsions to enhance MR-guided ultrasound-mediated tumor ablation in vivo," *Journal of Healthcare Engineering*, 4:109-126 (2013).
11. Yohe ST, **Kopechek JA**, Porter TM, Grinstaff MW, "Triggered Drug Release from 3D Superhydrophobic Meshes using High-Intensity Focused Ultrasound," *Advanced Healthcare Materials*, 2:1204-1208 (2013).
12. Zhang P, **Kopechek JA**, Porter, TM, "The impact of vaporized nanoemulsions on ultrasound-mediated ablation," *Journal of Therapeutic Ultrasound*, 1:2 (2013).
13. **Kopechek JA**, Haworth KJ, Radhakrishnan K, Huang S, Klegerman ME, McPherson DD, Holland CK, "The impact of bubbles on measurement of drug release from echogenic liposomes," *Ultrasonics Sonochemistry*, 20:1121-1130 (2013).

14. Radhakrishnan K, Bader KB, Haworth KJ, **Kopechek JA**, Raymond JL, Huang SL, McPherson DD, Holland CK, "Relationship between cavitation and loss of echogenicity from ultrasound contrast agents," *Physics in Medicine and Biology*, 58:6541-6563 (2013).
15. **Kopechek JA**, Zhang P, Burgess MT, Porter TM, "Synthesis of phase-shift nanoemulsions with narrow size distributions for acoustic droplet vaporization and bubble-enhanced ultrasound-mediated ablation," *Journal of Visualized Experiments*, 67:e4308 (2012).
16. Haworth KJ, Mast TD, Radhakrishnan K, Burgess MT, **Kopechek JA**, Huang SL, Klegerman ME, McPherson DD, Holland CK, "Passive imaging with pulsed ultrasound insonations," *Journal of the Acoustical Society of America*, 132:544-553 (2012).
17. **Kopechek JA**, Haworth KJ, Raymond JL, Perrin Jr. SR, Klegerman ME, Huang S, Porter TM, Mast TD, McPherson DD, Holland CK, "Acoustic characterization of echogenic liposomes: frequency-dependent attenuation and quantitative backscatter," *Journal of the Acoustical Society of America*, 130:3472-3481 (2011).
18. **Kopechek JA**, Kim H, McPherson DD, Holland, CK, "Calibration of the 1-MHz Sonitron ultrasound systems," *Ultrasound in Medicine and Biology*, 36:1762-1766 (2010).
19. Smith DAB, Vaidya SS, **Kopechek JA**, Huang SL, Klegerman ME, McPherson DD, Holland CK, "Ultrasonically triggered release of recombinant tissue-type plasminogen activator (rt-PA) from echogenic liposomes," *Ultrasound in Medicine and Biology*, 36:145-157 (2010).
20. Laing ST, Kim H, **Kopechek JA**, Parikh D, Huang S, Klegerman ME, Holland CK, McPherson DD, "Ultrasound-mediated delivery of echogenic immunoliposomes to porcine vascular smooth muscle cells in vivo," *Journal of Liposome Research*, 20: 160-167 (2010).
21. Herbst SM, Klegerman ME, Kim H, Shelat H, Wassler M, Moody MR, Yang CM, Ge X, Zou Y, **Kopechek JA**, Clubb FJ, Kraemer DC, Huang S, Holland CK, McPherson DD, Geng YJ, "Targeted delivery of stem cells to porcine arterial wall with echogenic liposomes conjugated to antibodies against CD34 and Intercellular Adhesion Molecule-1," *Molecular Pharmaceutics*, 7:3-11 (2010).
22. **Kopechek JA**, Abruzzo TM, Wang B, Chrzanowski SM, Smith DAB, Kee PH, Huang S, Collier JH, McPherson DD, Holland CK, "Ultrasound-mediated release of hydrophilic and lipophilic agents from echogenic liposomes," *Journal of Ultrasound in Medicine*, 27:1597-1606 (2008).
23. Kee PH, Abruzzo TA, Smith DAB, **Kopechek JA**, Wang B, Huang SL, MacDonald RC, Holland CK, McPherson DD, "Synthesis, acoustic stability and pharmacologic activities of Papaverine-loaded echogenic liposomes for ultrasound controlled drug delivery," *Journal of Liposome Research*, 18:263-277 (2008).

Book Chapters

1. Porter TM, **Kopechek JA**, "Ultrasound-Responsive Nanomedicine", in "Stimuli-Responsive Nanomedicine", ed. Zhu L, Jenny Stanford Publishing (2020), ISBN: 978-981-4800-70-9.

Abstracts and Conference Presentations

(Underline indicates mentored student)

1. Rashed MZ, **Kopechek JA**, Priddy MC, Hamorsky KT, Palmer KE, Mittal N, Valdez J, Williams SJ. "Electrochemical Impedance-based Detector for SARS-CoV-2 Antibodies," MicroTAS, October 2020 (virtual conference).
2. **Kopechek JA**, Priddy MC, Otto MR, Janis BR, Bates PJ, Harbrecht BG, Menze MA. "Transfusion of Trehalose-loaded Red Blood Cells in a Rat Hemorrhage Model after Cryopreservation," Military Health System Research Symposium, August 2020 (conference cancelled).
3. Janis BR, Elder CA, Smith JS, Priddy MC, **Kopechek JA**, Menze MA. "Sonoporation-Mediated Trehalose Loading for Red Blood Cell Stabilization," Society for Cryobiology meeting, July 2020 (virtual conference).
4. Elder CA, Smith JS, Janis BR, Mills E, Almosawi M, **Kopechek JA**, Menze MA. "Process Optimization for Lyophilization of Red Blood Cells," Society for Cryobiology meeting, July 2020 (virtual conference).
5. Grimm D, Shaffer C, **Kopechek J**, Menze M. "Bursting the Microbubble: Sonoporation-Mediated Compound Loading into Cells," Society for Cryobiology meeting, July 2020 (virtual conference).
6. **Kopechek JA**, Murphy E, Stamp B, Centner C, Patel R, Priddy M, Emmons R, Bates P, Yaddanapudi K. "Acoustofluidic-mediated Molecular Delivery to Human T Cells for Improved Cancer Therapies," Acoustical Society of America, May 2020 (conference cancelled).
7. **Kopechek JA**, Priddy MC, Feroze R, Chen X, Villanueva FS. "Ultrasound and microbubble-targeted delivery of microRNA therapeutics to the heart for cardiac therapies," 25th European Symposium on Ultrasound Contrast Imaging, January 2020, Rotterdam, the Netherlands.
8. Otto MR, Priddy MC, Higgins LA, Moore JB, Wysoczynski M, Bolli R, **Kopechek JA**. "Ultrasound Contrast Agents Enhance In Vivo Delivery of miR-302b Mimics and antimiR-34a to Mouse Hearts," American Heart Association Scientific Sessions, November 2019, Philadelphia, PA, USA.
9. Centner CS, Priddy MC, Moore JT, Bates PJ, Menze MA, **Kopechek JA**, "Effect of Acoustofluidic Flow Velocity on Intracellular Molecular Delivery," Biomedical Engineering Society Annual Meeting, October 2019, Philadelphia, PA, USA.
10. **Kopechek JA**, McTiernan CF, Chen X, Zhu J, Mburu M, Feroze R, Whitehurst DA, Lavery L, Cyriac J, Villanueva FS, "Ultrasound and Microbubble-targeted Delivery of a microRNA Inhibitor to the Heart Suppresses Cardiac Hypertrophy and Preserves Cardiac Function," International Bubble Conference, September 2019, Chicago, IL, USA.
11. Centner CS, Priddy MC, Bates PJ, Menze MA, **Kopechek JA**, "Effect of Acoustofluidic Flow on Intracellular Molecular Delivery," Kentucky Nanotechnology and Additive Manufacturing Symposium, August 2019, Louisville, KY, USA.
12. Murphy EM, Priddy MC, Janis BR, Menze MA, **Kopechek JA**, " Optimization of molecular delivery to red blood cells using an ultrasound-integrated microfluidic system," 177th meeting of the Acoustical Society of America, May 2019, Louisville, KY, USA. *Journal of the Acoustical Society of America*, 145:1895 (2019).

13. Centner CS, Priddy MC, **Kopechek JA**, "Standing Acoustic Waves in Microfluidic Channels for Enhanced Intracellular Delivery of Molecular Compounds," 177th meeting of the Acoustical Society of America, May 2019, Louisville, KY, USA. *Journal of the Acoustical Society of America*, 145:1894 (2019).
14. Campbell MR, Priddy MC, **Kopechek JA**, "Detection of Nucleic Acid-loaded Microbubbles in Mouse Hearts during Ultrasound-mediated Delivery," 177th meeting of the Acoustical Society of America, May 2019, Louisville, KY, USA. *Journal of the Acoustical Society of America*, 145:1746 (2019).
15. Centner CS, Murphy EM, Stivers CM, Burns MS, Priddy MC, Janis BR, Menze MA, **Kopechek JA**, "Development of a High-Performance Ultrasonic Flow System for Cell Transformation," IEEE International Symposium on Signal Processing and Information Technology (ISSPIT), December 2018, Louisville, KY, USA.
16. Priddy MC, Wysoczynski M, Moore JB, Hill B, Patibandla P, Giridharan G, Bolli R, **Kopechek JA**, "Ultrasound-mediated Delivery of antimiR-34a to Cardiac Cells for Cardiovascular Therapy," American Heart Association Scientific Sessions, November 2018, Chicago, IL, USA. *Circulation*, 138:A14926.
17. Feroze RA, **Kopechek J**, Lavery L, Cyriac J, Zhu J, Chen X, Villanueva F, "Targeted Cardiac Delivery of miR-29b Mimic via Ultrasound-Mediated Microbubble Cavitation Attenuates Myocardial Fibrosis," American Heart Association Scientific Sessions, November 2018, Chicago, IL, USA. *Circulation*, 138:A16934.
18. Murphy EM, Priddy MC, Janis BR, Menze MA, **Kopechek JA**, "Ultrasound-enhanced Molecular Delivery to Red Blood Cells in a Microfluidic System for Dry Storage," Biomedical Engineering Society Annual Meeting, October 2018, Atlanta, GA, USA.
19. Janis BR, Priddy MC, Murphy EM, **Kopechek JA**, Menze MA, "Dry-Preservation of Red Blood Cells," AABB Annual Meeting, October 2018, Boston, MA, USA. *Transfusion*, 58(Suppl 2): 6A–254A. *(Top 1% Poster Award)*
20. Janis BR, Priddy MC, **Kopechek JA**, Menze MA, "Dry-Preserved Red Blood Cells For Transfusions in Far-Forward Settings," Military Health System Research Symposium, August 2018, Kissimmee, FL, USA.
21. Stivers CM, Burns MS, Murphy EM, Priddy MC, **Kopechek JA**, "An Ultrasound-Integrated Microfluidic Platform to Enhance Intracellular Molecular Delivery," Kentucky Nanotechnology and Additive Manufacturing Symposium, August 2018, Louisville, KY, USA.
22. Murphy EM, Priddy MC, Janis BR, Menze MA, **Kopechek JA**, "Ultrasound-enhanced Molecular Delivery to Red Blood Cells in a Microfluidic System for Dry Storage," Kentucky Nanotechnology and Additive Manufacturing Symposium, August 2018, Louisville, KY, USA.
23. Murphy EM, Priddy MC, Janis BR, Menze MA, **Kopechek JA**. "Correlation of Cavitation Activity with Ultrasound-enhanced Delivery of Compounds to Erythrocytes Ex Vivo," 175th meeting of the Acoustical Society of America, May 2018, Minneapolis, MN, USA. *Journal of the Acoustical Society of America*, 143:1861 (2018).

24. Janis BR, Priddy MC, DeFilippis A, Ayyoubi T, **Kopechek JA**, Menze MA. "Dry-Preservation of Red Blood Cells for Storage at Ambient Temperatures," NASA Human Research Program Workshop, January 2018, Galveston, TX, USA.
25. Bhutto DF, Murphy EM, Priddy MC, Centner CC, Moore JB, Bolli R, **Kopechek JA**. "Effect of Molecular Weight on Ultrasound-Targeted Drug Delivery," Biomedical Engineering Society meeting, October 2017, Phoenix, AZ, USA.
26. Murphy EM, Hodge DA, Bates PJ, Malik MT, **Kopechek JA**, "Targeted Delivery of Chemotherapeutics to Human Cancer Cells with Aptamer-conjugated Nanoemulsions," Biomedical Engineering Society meeting, October 2017, Phoenix, AZ, USA.
27. Bhutto DF, Murphy EM, Zhao J, Moore JB, Bolli R, **Kopechek JA**, "Effect of molecular weight on sonoporation-mediated uptake in human cardiac cells," 173rd Meeting of the Acoustical Society of America, June 2017, Boston, MA, USA. *Journal of the Acoustical Society of America*, 141:4011 (2017).
28. **Kopechek JA**, McTiernan CF, Chen X, Feroze R, Qin B, Cyriac J, Lavery L, Whitehurst D, Villanueva FS, "Targeted Delivery of AntimiR-23a using Ultrasound and Microbubbles Suppresses Cardiac Hypertrophy and Improves Cardiac Function," American Heart Association Scientific Sessions, November 2016, New Orleans, LA, USA. *Circulation*, 134:A12592. (*Best Early Career Poster Award in Clinical Science*)
29. **Kopechek JA**, Carson AR, McTiernan CF, Chen X, Feroze R, Lavery L, Hasjim B, Villanueva FS, "Targeted Delivery of an Anti-miR to Cardiomyocytes Using Ultrasound and Microbubbles Suppresses Hypertrophy," American Heart Association Scientific Sessions 2015, November 2015, Orlando, FL, USA. *Circulation*, 132:A14662.
30. Whitehurst DA, **Kopechek JA**, Villanueva FS, "Ultrasound and Microbubble-Mediated Delivery of Therapeutic miRNA Inhibitor to Promote Angiogenesis," BMES Annual Meeting, September 2015, Tampa, FL, USA.
31. **Kopechek JA**, Carson AR, Chen X, McTiernan CF, Hasjim B, Sen M, Grandis JR, Villanueva FS, "Targeted Therapeutic Gene Knockdown Using Ultrasound And Microbubble-mediated Delivery Of A Transcription Factor Decoy," 20th European Symposium on Ultrasound Contrast Imaging, January 2015, Rotterdam, The Netherlands.
32. **Kopechek JA**, Carson AR, Chen X, McTiernan CF, Lavery L, Hasjim B, Sen M, Grandis JR, Villanueva FS, "Targeted Therapeutic Gene Knockdown Using Ultrasound And Microbubble-mediated Delivery Of A Transcription Factor Decoy," American Heart Association Scientific Sessions, November 2014, Chicago, IL, USA. *Circulation*, 130:A17622.
33. Carson AR, **Kopechek JA**, Chen X, McTiernan CF, Lavery L, Hasjim B, Sen M, Grandis JR, Villanueva FS, "Delivery of transcription factor decoy using ultrasound and microbubble technology in a murine model," American Heart Association Scientific Sessions, November 2014, Chicago, IL, USA. *Circulation*, 130:A19114.
34. Nguyen MM, **Kopechek JA**, Hasjim B, Villanueva FS, Kim K, "Passive cavitation imaging with nucleic acid-loaded microbubbles in mouse tumors," 168th Meeting of the Acoustical Society of

America, October 2014, Indianapolis, IN, USA. *Journal of the Acoustical Society of America*, 136:2302 (2014).

35. **Kopechek JA**, Carson AR, Chen X, McTiernan CF, Hasjim B, Sen M, Grandis JR, Villanueva FS, "Effect of cavitation on ultrasound and microbubble-mediated gene knockdown in squamous cell carcinoma," IEEE International Ultrasonics Symposium, September 2014, Chicago, IL, USA.
36. **Kopechek JA**, Park EJ, Zhang YZ, McDannold NJ, Porter TM, "Correlation of Cavitation Activity with Enhanced Focused Ultrasound-mediated Heating and Ablation using Vaporized Phase-shift Nanoemulsions," Biomedical Engineering Society Annual Meeting, September 2013, Seattle, WA, USA.
37. **Kopechek JA**, Porter TM, "Ultrasound-triggered Drug Release from Monodisperse Double-Emulsion Phase-Change Droplets Produced by Microfluidics," Advances in Microfluidics & Nanofluidics, May 2013, South Bend, IN, USA.
38. **Kopechek JA**, Park EJ, Zhang YZ, McDannold NJ, Porter TM, "Enhanced MR-guided HIFU Ablation of Rabbit VX2 Tumors In Vivo using Phase-Shift Nanoemulsions," 3rd International Focused Ultrasound Symposium, October 2012, Bethesda, MD, USA. *(Young Investigator Travel Award)*
39. Radhakrishnan K, Haworth KJ, **Kopechek JA**, Huang B, Huang S, McPherson DD, Holland CK, "Pulse duration dependence of cavitation emissions and loss of echogenicity from ultrasound contrast agents insonified by Doppler pulses," 164th Meeting of the Acoustical Society of America, October 2012, Kansas City, MO, USA. *Journal of the Acoustical Society of America*, 132:2037 (2012).
40. **Kopechek JA**, Park EJ, McDannold NJ, Porter TM, "Nanoparticle-enhanced thermal ablation in vivo with MR-guided HIFU," 9th International Interventional MRI Symposium, September 2012, Boston, MA, USA.
41. Yohe ST, **Kopechek JA**, Porter TM, Grinstaff MW. "Triggered drug release from 3D superhydrophobic meshes using ultrasound," 244th ACS National Meeting, August 2012, Philadelphia, PA, USA.
42. **Kopechek JA**, Haworth KJ, Radhakrishnan K, Huang S, Klegerman ME, McPherson DD, Holland CK, "The impact of microbubbles on measurement of drug release from echogenic liposomes," Acoustics 2012 / 154th Meeting of the Acoustical Society of America, May 2012, Hong Kong. *Journal of the Acoustical Society of America*, 131:3246 (2012).
43. **Kopechek JA**, Zhang P, Porter TM, "Enhanced heating and lesion formation using phase-shift nanoemulsions vaporized by high intensity focused ultrasound," 30th Annual Meeting of the Society for Thermal Medicine, April 2012, Portland, OR, USA.
44. Haworth KJ, Mast TD, Radhakrishnan K, **Kopechek JA**, Burgess MT, Huang S, McPherson DD, Holland CK. "Passive Cavitation imaging of echogenic liposomes insonified with 6 MHz pulsed Doppler ultrasound in a flow phantom," 161st Meeting of the Acoustical Society of America, May 2011, Seattle, WA, USA. *Journal of the Acoustical Society of America*, 129:2513 (2011).
45. Radhakrishnan K, **Kopechek JA**, Haworth KJ, Huang S, McPherson DD, Holland CK, "Relationship between cavitation, rapid loss of echogenicity and drug release from echogenic liposomes," 159th Meeting of the Acoustical Society of America, April 2010, Baltimore, MD, USA. *Journal of the Acoustical Society of America*, 127:1975 (2010).

46. Holland CK, **Kopechek J**, Hitchcock K, Caudell D, Pyne-Geithman GP, Huang SL, McPherson DD, "Ultrasound-Mediated Drug Delivery using Echogenic Liposomes," 15th European Symposium on Ultrasound Contrast Imaging, January 2010, Rotterdam, The Netherlands.
47. Holland CK, **Kopechek JA**, Hitchcock K, Sutton J, Caudell D, Pyne-Geithman G, Huang S, McPherson DD, "Ultrasound Mediated Drug Delivery," 12th Congress of the World Federation for Ultrasound in Medicine and Biology, August 2009, Sydney, Australia. *Ultrasound in Medicine and Biology*, 35:S33 (2009).
48. **Kopechek JA**, Porter TM, Coussios CC, Perrin SR, Huang SL, McPherson DD, Holland CK, "Acoustic characterization of echogenic liposomes: attenuation and quantitative backscatter," 157th Meeting of the Acoustical Society of America, May 2009, Portland, OR, USA. *Journal of the Acoustical Society of America*, 125:2712-2713 (2009).
49. **Kopechek JA**, Chrzanowski SM, Smith DAB, Gaskins WB, Abruzzo TA, Huang SL, McPherson DD, Holland CK, "Ultrasound-mediated release of calcein from echogenic liposomes," 154th Meeting of the Acoustical Society of America, November 2007, New Orleans, LA, USA. *Journal of the Acoustical Society of America*, 122:3007 (2007).
50. Smith DAB, Vaidya S, **Kopechek JA**, Hitchcock KE, Huang SL, McPherson DD, Holland CK, "Echogenic liposomes loaded with recombinant tissue-type plasminogen activatory (rt-PA) for image-guided, ultrasound-triggered drug release," 154th Meeting of the Acoustical Society of America, November 2007, New Orleans, LA, USA. *Journal of the Acoustical Society of America*, 122:3007 (2007).
51. Abruzzo T, Wang B, **Kopechek J**, Kee P, Smith D, Collier J, McDonald R, McPherson D, Holland C, "Ultrasound-Mediated Drug Release From Nanoscale Echogenic Liposomes," 2007 AIUM Annual Convention, March 2007, New York, NY, USA. *Journal of Ultrasound in Medicine*, 26:S119 (2007).

Patent Applications

1. Menze M, **Kopechek JA**, Janis B, "Systems and Methods for Cryopreservation of Cells", US Pat. App. No. 62/519,638, filed June 14, 2018 (pending).
2. Malik MT, **Kopechek JA**, Bates PJ, "Thiolated Aptamers on Nanodroplet Emulsions," US Pat. App. No. 62/370,137, filed August 2, 2017 (pending).

Commercialization Activity

1. Co-founded a startup company (DesiCorp, Inc.) in 2017 focused on commercializing a new dried blood product
    a. UofL optioned IP from patent (Kopechek co-inventor) to DesiCorp in 2019
    b. DesiCorp selected for SBIR Phase I funding by DoD DHA in January 2020 ($250,000)
2. Optioned IP from patent (Kopechek co-inventor) to Cook Regentec in 2018 (now "Sexton Biotechnologies")

Honors and Awards

2017-2019	Faculty Favorite, University of Louisville
2017	Scientist Development Grant, American Heart Association
2016	Best Early Career Poster Award in Clinical Science, American Heart Association Scientific Sessions
2016	Basic Science Award (3rd place), American Heart Association Fellows Research Day
2015	Post-Doctoral Fellow Translational Science Award (3rd place), University of Pittsburgh School of Medicine Research Day
2015-2016	Ruth L. Kirschstein National Research Service Award, National Institutes of Health
2012-2013	Boston University Cross-disciplinary Training in Nanotechnology for Cancer (XTNC) Postdoctoral Fellowship
2012	Young Investigator Travel Award, Focused Ultrasound Surgery Foundation
2011	Excellence in BME PhD Research Award, University of Cincinnati
2006-2008	University Graduate Scholarship, University of Cincinnati
2006	Graduated Cum Laude with Honors and Distinction, The Ohio State University
2005-2006	Research Internship, Engineering Experiment Station, The Ohio State University
2005	Hoelle Scholarship, Dept. of Electrical & Computer Engineering, The Ohio State University
2003	Gee Scholarship, Dept. of Electrical & Computer Engineering, The Ohio State University

Pending Research Support

Development of dried blood for prolonged field care in austere environments
DoD CDMRP Grant (Recommended for Funding in January 2020, start date anticipated in July)
Project Period: July 2020 – June 2023, Total Cost: $999,514
PIs: **Jonathan Kopechek** (18% effort), Michael Menze
The objective of this project is to conduct preclinical testing in small and large animal models to assess the safety and efficacy of a new dried blood product prior to initiating clinical trials.

Active Research Support

PFI-RP: Development of Delivery Devices to Enable Cell Transformation or Preservation
NSF Partnership for Innovation Grant (#1827521)
Project Period: September 2018 – August 2021, Total Cost: $805,000
PIs: **Jonathan Kopechek** (10% effort), Paula Bates, Michael Menze, Robert Keynton
The objective of this project is to develop advanced technologies for cell preservation and cell transformation that have significant potential for commercialization.

Ultrasound-Targeted Delivery of miRNA Therapeutics for Cardiac Repair after Myocardial Infarction
AHA Scientist Development Grant, Award number: 17SDG33660284, Percentile Rank: 0.28%
Project Period: July 2017 – June 2020, Total Direct Cost: $210,000
PI: **Jonathan Kopechek** (15% effort)

The objective of this project is to develop a theranostic platform utilizing ultrasound and microbubbles to deliver miRNA therapeutics for cardiac repair following myocardial infarction.

Development of Clinical-Scale Processing Methods for Dry Preservation of Red Blood Cells
UofL Innovation Grant
Project Period: August 2019 – June 2020, Total Direct Cost: $60,000
PIs: **Jonathan Kopechek** (1% effort), Michael Menze, Brian Harbrecht
The objective of this project is to develop methods for production of dried red blood cells at clinically-relevant concentrations and production rates.

Evaluation of Preserved Blood for Transfusion Therapy in Reduced Gravity
NASA REDDI Grant (Flight Opportunities program)
Project Period: January 2019 – December 2019 (NCE to 12/31/20), Total Direct Cost: $275,000
PIs: **Jonathan Kopechek** (2% effort), Michael Menze
The objective of this project is to evaluate rehydration and stability of trehalose-preserved dried blood under simulated zero gravity conditions as a step toward potential use in long-duration space missions.

Advanced Cell Processing System for Cell-based Immunotherapies
UofL I-Corps Grant (funded by NSF)
Project Period: February 2020 – January 2021, Total Direct Cost: $2,500
PIs: **Jonathan Kopechek** (1% effort)
The objective of this project is to explore potential commercialization of a microfluidic device designed to precisely deliver preservative compounds into T-cells or other cells to improve transfection methods and manufacturing of cell therapies.

Past Research Support

Exercise and inactivity after SCI: Quantifying muscle changes over time
Helmsley Foundation Pilot Grant
Project Period: February 2019 – January 2020, Total Direct Cost: $50,000
PIs: **Jonathan Kopechek** (8% effort), David Magnuson
The objective of this project is to evaluate the effects of exercise or inactivity on muscle change over time after spinal cord injury using advanced ultrasound imaging techniques.

Development of Prototype for Rehydration of Dried Blood under Reduced Gravity
NASA KY Space Grant Undergraduate Fellowship Program
Project Period: January 2019 – December 2019, Total Direct Cost: $6,000
PI: **Jonathan Kopechek** (1% effort)
The objective of this project is to develop and validate a prototype system for rehydration of dried blood under simulated zero gravity conditions during parabolic flights in order to increase the technology

readiness level for long-duration space missions. This fellowship was awarded to UofL Bioengineering student John T. Moore.

I-Corps: Dry Preservation of Blood for Long-Term Storage at Ambient Temperatures
NSF I-Corps Grant (#1911738)
Project Period: January 2019 – November 2019, Total Direct Cost: $50,000
PI: **Jonathan Kopechek** (1% effort)
The objective of this project is to perform customer discovery to evaluate the potential commercialization opportunities for dried blood

An integrated microfluidic device for long-term preservation of dried red blood cells at ambient temperature
UofL ExCITE Grant (funded by NIH grant U01 HL127518)
Project Period: August 2017 – August 2019, Total Direct Cost: $150,000
PIs: **Jonathan Kopechek** (5% effort), Michael Menze, Brett Janis
The objective of this project is to develop an ultrasound-integrated microfluidic device to precisely deliver preservative compounds into red blood cells for long-term storage at ambient temperature

An integrated microfluidics device for long-term preservation of red blood cells at ambient temperatures
UofL I-Corps Grant (funded by NSF)
Project Period: August 2017 – July 2018, Total Direct Cost: $2,500
PIs: **Jonathan Kopechek** (1% effort), Michael Menze, Brett Janis
The objective of this project is to explore potential commercialization of a microfluidic device designed to precisely deliver preservative compounds into red blood cells for long-term storage at ambient temperatures.

Ultrasound-mediated modulation of microRNAs for treatment of cardiac hypertrophy
NIH/NHLBI Postdoctoral Fellowship, Grant number: F32 HL126421, Impact Score: 10 (1st percentile)
Project Period: January 2015 – March 2016, Total Direct Cost: $63,129
PI: **Jonathan Kopechek** (100% effort), Sponsor: Flordeliza S. Villanueva, M.D.
The objective of this project was to develop a theranostic platform utilizing ultrasound and microbubbles to therapeutically regulate microRNA levels in the heart for treatment of cardiac hypertrophy

Ultrasound-triggered Release of Doxorubicin from Monodisperse Vaporizable Droplet-containing Liposomes for Treatment of Hepatocellular Carcinoma
Boston University Cross-disciplinary Training in Nanotechnology for Cancer (XTNC) Postdoctoral Fellowship (funded by NIH grant R25 CA153955)
PI: **Jonathan Kopechek** (100% effort), Sponsors: Tyrone M. Porter, Ph.D., and David C. Seldin, M.D., Ph.D.

Project Period: September 2012 – May 2013, Total Direct Cost: $23,250
The goal of this project was to develop a microfluidics platform to produce monodisperse double-emulsion droplets loaded with doxorubicin for ultrasound-targeted delivery to hepatocellular carcinoma cells.

Teaching Activities

New courses developed at University of Louisville

BE 522: Biomedical Acoustics. This course covers the fundamentals of acoustic wave propagation with a focus on ultrasound imaging and other applications including speed/hearing and non-destructive testing of materials.

Courses taught at University of Louisville (classroom format)

BE 322: "Circuits and Devices for Bioengineers" (Su 2016, Su 2017)
BE 340: "Computational Methodologies for Bioengineering" (Su 2017, Su 2018, Su 2019)
BE 430: "Biosystems Controls" (Fall 2018, Fall 2019)
BE 522: "Biomedical Acoustics" (Fall 2018, Fall 2019)

Courses taught at University of Louisville (online format)

BE 340: "Computational Methodologies for Bioengineering" (Su 2017, Sp 2018, Su 2018, Sp 2019, Su 2019, Fall 2019)
BE 430: "Biosystems Controls" (Sp 2019, Sp 2020)
BE 522: "Biomedical Acoustics" (Su 2019, Fall 2019, Sp 2020)

Overall Teaching Scores (classroom format only)

	BE322	BE340	BE430	BE522
2016	4.52	N/A	N/A	N/A
2017	4.65	4.64	N/A	N/A
2018	N/A	4.72	4.87	4.63
2019	N/A	4.43	4.84	4.95

Overall Teaching Scores (online format only)

	BE322	BE340	BE430	BE522
2016	N/A	N/A	N/A	N/A
2017	N/A	4.25 (n=1)	N/A	N/A
2018	N/A	4.50 (n=2)	N/A	N/A
2019	N/A	5.00 (n=1)	N/A	4.58 (n=6)

Samples of Student Comments from Course Evaluations

- "Absolute best and favorite teacher here at UofL! Extremely helpful when any student is struggling too! He will always be one of my absolute favorite BE teachers at UofL! He really takes the time and effort to teach and makes sure the students understand the material."
- "He is my favorite professor! I've learned so much in his classes, and he is always super excited to teach, which makes me excited to learn!"
- "Dr. Kopechek is amazing! His classes are always fun, and he truly cares that we are learning. He goes above and beyond to make sure we have the time and resources we need to succeed, whether it's extending a deadline when the whole class is struggling, or allowing us to call him on his cell phone with questions about a project while he's on his way back from the airport. He is our Spiderman and the BE Department wouldn't be the same without him!"
- "He is truly a caring man! I struggled with learning programming my freshman year and dreaded BE 340 (computational methodologies) my junior year. He made it very easy to learn and would stay for hours after class to help us with our programs. I have never met a professor more inclined to help students than him."
- "Dr. Kopechek is very kind and patient. He was easily approachable and was always willing to help me with subjects and concept applications that I was struggling with. Dr. Kopechek made lectures enjoyable, and class was always relaxed and engaging. We felt comfortable asking questions, and he was always willing to expand upon topics. I learned a lot about acoustics, which is an area he is clearly passionate about and has a wealth of knowledge and experience in. I have been interested in this subject for a long time, and I am glad that Dr. Kopechek taught this course. Thank you, Dr. Kopechek!"
- "One of the most supportive and helpful professors in the department."
- "I have had Dr. Kopechek for several classes during my time at Speed School, and he is one of my favorite professors for several reasons. He always has a great attitude about teaching, he goes out of his way to ensure that every single student understands the content, he is willing to help students in any way that he can, and he has really made me appreciate how the content that we learn at school will be used in our professional careers."
- "Dr. Kopechek is one of the best professors at the University, and he truly cares about his students and their success. He does whatever he can to help students understand some of the most difficult material and is extremely kind and understanding."
- "Dr. Kopechek is awesome! He wants everyone to truly understand the material and goes above and beyond to help any way he can. His positive attitude makes some of the harder topics bearable. I am very thankful that I have had him for multiple courses in the BE department. He rocks!"
- "I have never had a professor as committed to his students and their success as Dr. Kopechek. He is invested in the material he teaches and goes above and beyond to make sure the students understand the content and are learning. His classes are always very engaging, and he presents the course material in such a way that is always easy-to-follow and makes direct applications to the field of bioengineering."
- "One of the best professors I have had while in the department. He goes above and beyond for every student in the class. Dr. Kopechek is passionate about his research and student success. Dr. Kopechek has positively impacted my learning experience with his interactive projects, real-world applications, and accessibility outside of the classroom. The Bioengineering Department is incredibly fortunate to have such a valuable professor."

Mentored Students/Fellows

Total number of students mentored: 31

PhD students: 1
MEng students: 9
Undergraduate students: 18
High school students: 3

Student Name	Role	Current Position
1. Mary Baxter	Undergraduate student in Bioengineering (Co-op advisor, 2020 – present)	
2. Danyal Bhutto	Undergraduate student in Bioengineering (Research mentor, 2016-2017)	PhD student in Biomedical Engineering at Boston University (as of 1/20)
3. Erik Black	Undergraduate/MEng student in Bioengineering (Co-op advisor, MEng thesis advisor, 2020)	
4. Marie Burns	MEng student in Bioengineering (MEng project mentor, 2018)	Product Specialist, Eurotrol (as of 1/20)
5. Meghan Campbell-Otto	MEng student in Bioengineering (Research mentor, 2018 – 2019)	Corrective Action/Preventative Action Engineer, Cook Medical (as of 1/20)
6. Ryan Cantrell	Undergraduate student in Bioengineering (Co-op advisor, 2020 – present)	
7. Sydney Cardinali	Undergraduate student in Bioengineering (Capstone project mentor, 2018)	
8. Connor Centner	Undergraduate/MEng/PhD student in Bioengineering (Capstone project mentor, MEng thesis advisor, and PhD advisor, 2016 – present)	
9. Brendon Daunhauer	Undergraduate student in Bioengineering (Capstone project mentor, 2019)	
10. Nicholas Doninger	Undergraduate student in Bioengineering (Capstone project mentor, 2019)	

11. Jacob Dvorjak	Undergraduate student in Bioengineering (Capstone project mentor, 2019)	
12. Maryam El-Baz	High school student (Research mentor, 2018 – 2019)	
13. Winston Furtado	Undergraduate student in Bioengineering (Capstone project mentor, 2017)	
14. Lauren Higgins	Undergraduate student in Bioengineering (Research mentor, 2019)	Histology Technician, Baptist Hospital (as of 1/20)
15. Daniel Hodge	Undergraduate/MEng student in Bioengineering (Capstone project mentor and MEng thesis advisor, 2016-2018)	Medical Student at UofL Medical School (as of 1/20)
16. Chris Holton	Undergraduate/MEng student in Bioengineering (Capstone project mentor and MEng thesis advisor, 2018– present)	
17. Rianne Kablan	Undergraduate student in Bioengineering (Research mentor, 2018 – 2019)	
18. Helen Lu	Undergraduate student in Bioengineering (Capstone project mentor, 2016)	Medical Student at UofL Medical School (as of 1/20)
19. John T. Moore	Undergraduate student in Bioengineering (Research mentor/co-op advisor, 2018 – present)	
20. David Morris	MEng student in Bioengineering (MEng project mentor, 2020)	
21. Sage Morrison	MEng student in Bioengineering (MEng project mentor, 2020)	
22. Emily Murphy	Undergraduate Co-op student/MEng student in Bioengineering (Capstone project mentor, co-op advisor, and MEng thesis advisor, 2016 – 2019)	AstraZeneca (as of 5/20)
23. Ashutosh Nayak	Undergraduate student in Bioengineering (Capstone project mentor, 2018)	

24. Shivani Nellore	High school student in Brown Cancer Summer Research Internship program (Research mentor, 2016)	
25. Jessica Nguyen	Undergraduate student in Bioengineering (Capstone project mentor, 2019)	
26. Riyakumari Patel	Undergraduate student in Bioengineering (Co-op advisor, 2019 – present)	
27. Caitlin Ryan	MEng student in Bioengineering (MEng project mentor, 2019)	
28. Isis Shackelford	Undergraduate student in Bioengineering (Co-op advisor, 2020 – present)	
29. Morgan Sharp	Undergraduate student in Bioengineering (Capstone project mentor, 2017)	PhD student in Neuroscience at UofL (as of 1/20)
30. Caroline Stivers	Undergraduate student/MEng student in Bioengineering (Capstone project mentor and MEng project mentor, 2017-2018)	Technology Transfer Coordinator, Leidos (as of 1/20)
31. Samrat Tanwani	High school student in Brown Cancer Summer Research Internship program (Research mentor, 2016)	

Graduate Thesis Committees

Connor Centner, M.Eng. Thesis, "Tumor-targeted double emulsions for ultrasound-triggered delivery of molecular therapeutics", July 2018 (Role: Committee Chair)

Daniel Hodge, M.Eng. Thesis, "The effectiveness of localized ultrasound and aptamer surface modification on nanoemulsions for drug delivery to spheroids," July 2018 (Role: Committee Chair)

Emily Murphy, M.Eng. Thesis, "Non-viral transfection efficiencies for the advancement of CAR-T therapy," July 2019 (Role: Committee Chair)

Rachel Zalla, M.Eng. Thesis, "Evaluation of tracing techniques in the rat spinal cord using a custom MATLAB application," May 2020 (Role: Committee Member)

Christopher Holton, M.Eng. Thesis, "Mathematical characterization of a microfluidic ultrasound driven transfection device," May 2020 (Role: Committee Chair)

Refereed Journals

Academic Radiology
Biological Chemistry
Cancers
Diagnostics
Drug Delivery
IEEE Journal of Biomedical and Health Informatics
IEEE Transactions on Medical Imaging
IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control
Journal of Clinical Medicine
Journal of Pediatrics
Journal of Therapeutic Ultrasound
Journal of Visualized Experiments
Molecular Pharmaceutics
Nature Nanotechnology
Physics in Medicine and Biology
PLoS One
Technology in Cancer Research and Treatment
Theranostics
Therapeutic Delivery
Ultrasound in Medicine and Biology (over 30 manuscripts reviewed)
Ultrasonics Sonochemistry

Active Professional Memberships

American Heart Association (2014 – present)
Acoustical Society of America (2017 – present)
Biomedical Engineering Society (2018 – present)

Committee Service

ABET Assessment Committee (2016 – present)

Grant Review Panels

American Heart Association (2019, 2020)
National Science Foundation (2019, 2020)

Conference Sessions Chaired

Scientific session on "Ultrasound Contrast Agents: Nonlinear Bubble Dynamics." 169th meeting of the Acoustical Society of America, Pittsburgh, PA, May 2015.

Scientific session on "Ultrasound Contrast Agents: Molecular Imaging Applications." 169th meeting of the Acoustical Society of America, Pittsburgh, PA, May 2015.

Scientific session on "Cardiovascular Ultrasound: Imaging and Therapy." 177th meeting of the Acoustical Society of America, Pittsburgh, PA, May 2019.