

CURRICULUM VITAE - Kevin J. Haworth, Ph.D.

CONTACT INFORMATION 231 Albert Sabin Way *E-mail:* kevin.haworth@uc.edu
Cardiovascular Center, 3939 *Office:* 513.558.3536
Cincinnati, OH 45267-0586 *Fax:* 513.558.6102

EDUCATION **University of Michigan** - Ann Arbor, Michigan
Ph.D. (Applied Physics), May 2009
Dissertation: Medical Ultrasound Aberration Correction via Acoustic Droplet Vaporization and Time-Reversal Acoustics, advised by Oliver D. Kripfgans and Paul L. Carson, available at:
<http://hdl.handle.net/2027.42/62409>

M. S. (Applied Physics), April 2006

Truman State University - Kirksville, Missouri
B. S. (Physics), Summa Cum Laude, General and Departmental Honors, May 2003

ACADEMIC APPOINTMENTS 2012 - present Assistant Professor (Research)
Department of Internal Medicine, Division of Cardiovascular Diseases
Department of Biomedical Engineering (secondary, 2012-present)
Department of Pediatrics (secondary, 2016-present)
University of Cincinnati, Cincinnati, Ohio
2010 - 2012 Ruth L. Kirschstein NRSA (NIH/F32) Postdoctoral Fellow
Department of Internal Medicine, Division of Cardiovascular Diseases
University of Cincinnati, Cincinnati, Ohio
2009 - 2010 Postdoctoral Fellow
Department of Biomedical Engineering
University of Cincinnati, Cincinnati, Ohio
2008 - 2009 Rackham Predoctoral Fellow
Applied Physics Program and Department of Radiology
University of Michigan, Ann Arbor, Michigan
2003 - 2008 Applied Physics Fellow and Graduate Student Research Assistant
Applied Physics Program and Department of Radiology
University of Michigan, Ann Arbor, Michigan

RESEARCH GRANTS **Current Support**
Ultrasound-mediated oxygen scavenging for inhibition of reperfusion injury
NIH/NHLBI, Grant Number: K25HL133452
Aug 2016 - July 2020, Total Direct Cost: \$564,832, peer-reviewed

PI: Kevin J. Haworth

While new therapies to restore blood flow can be life-saving, up to half of the volume of heart tissue at risk during a heart attack dies, paradoxically, due to the return of blood flow. The previously oxygen-starved heart muscle responds to the oxygen by creating free radicals that damage the patient's heart cells, so-called reperfusion injury. This project uses an ultrasound-based technique to sequester oxygen from the blood to limit free radical formation and reduce reperfusion injury.

Echogenic Targeted Liposomes: Transfection/Drug Delivery

NIH/NHLBI, Grant Number: R01HL135092

April 2017 - March 2022, Total Direct Cost: \$2,928,036, Subcontract Total Direct Cost: \$934,988

PI: David D. McPherson; UC Subcontract PI: Christy K. Holland

This proposal seeks to develop a carrier (echogenic immunoliposomes) with novel ultrasound delivery methodologies that have the ability to incorporate therapeutics and enhance delivery to stabilize atherosclerotic beds at the time of intervention.

Role: Co-Investigator

Past Support

Microfluidic Manufacturing of Perfluorocarbon Droplets for Acoustic Droplet Vaporization

Interdisciplinary Faculty Research Support Grant, University Research Council, UC

May 2016 - May 2017, Total Direct Cost: \$25,000, peer-reviewed

PI: **Kevin J. Haworth**

This project developed a microfluidic manufacturing technique for ultrasound-triggered phase-shift emulsions.

Ultrasound-mediated oxygen scavenging for inhibition of reperfusion injury

American Heart Association National Scientist Development Grant, Grant Number: 16SDG27250231

Jan 2016 - Aug 2016**, Total Direct Cost Awarded: \$280,000, peer-reviewed

PI: **Kevin J. Haworth**

The goal of this project is to investigate the magnitude and kinetics of ultrasound-mediated oxygen scavenging and whether it can reduce reperfusion injury.

**Resigned due to awarding of grant K25HL133452

Multifunctional ultrasound-triggered emulsion for ischemic stroke

UC-CCHMC-VA CCTST KL2 Research Scholars Mentored Career Development Award

NIH Grant Number: 8KL2 TR000078-05

April 2013 - March 2015, Total Direct Cost: \$241,046, peer-reviewed

PI: **Kevin J. Haworth**

This NIH-CTSA KL2 award developed a novel technology for scavenging dissolved oxygen from fluids.

Thrombus elasticity for stroke treatment planning

Near Horizons UC Heart, Lung, and Vascular Institute

June 2014 - May 2015, Total Direct Cost: \$22,500, peer-reviewed

PI: **Kevin J. Haworth**

This project studied the relationship between clot response to a thrombolytic agent and the clot's elasticity and stiffness.

The development of standards to regulate microbubble cloud formation during histotripsy pulses

Focused Ultrasound Foundation Research Award, Grant Number: FUS319

August 2014 - July 2015, Total Direct Cost: \$107,520, peer-reviewed

PI: Kenneth B. Bader

This project developed in vitro and in silico models to assess the area, location, and type of microbubble activity and ablation during histotripsy ultrasound insonation. Ablation was monitored with passive cavitation imaging and used to ablate retracted whole blood clots.

Role: Co-Investigator

Ultrasound-triggered phase-shift emulsions for molecular imaging of atheroma

Rehn Family Research Award

August 2013 - July 2014, Total Direct Cost: \$13,500, peer-reviewed

PI: **Kevin J. Haworth**

This project investigated ultrasound-triggered phase-shift emulsions as an ultrasound contrast agent that is molecularly targeted to VEGF-A, an antigen associated with atheroma.

Ultrasound-Triggered Phase-Shift Emulsions for Thrombolysis

University of Cincinnati Cardiovascular Center of Excellence Seed Grant

April 2012 - June 2013, Total Direct Cost: \$10,000, peer-reviewed

PI: Christy K. Holland & Vladimir Bogdanov

This project established the protocols and experimental setups to obtain preliminary data on activation of ultrasound-triggered phase-shift emulsions.

Role: Co-Investigator

Passive Cavitation Image-Guided Ultrasound-Mediated Drug Delivery for Atheroma Therapy

NIH/NHLBI, Grant number: F32HL104916, Impact Score: 17, Percentile: 3.0

September 2010 - August 2012, Total Direct Cost: \$102,974, peer-reviewed

PI: **Kevin J. Haworth**, Sponsor: Christy K. Holland

This project sought to develop passive cavitation images for ultrasound-mediated local release and enhanced delivery of an anti-inflammatory drug for atheroma treatment using echogenic liposomes.

PEER-REVIEWED
PUBLICATIONS
trainees denoted
by underline

1. Kenneth B. Bader, **Kevin J. Haworth**, Adam D. Maxwell, and Christy K. Holland. (in press). Post Hoc Analysis of Passive Cavitation Imaging for Classification of Histotripsy-induced Liquefaction In Vitro. *IEEE Medical Imaging*
2. **Kevin J. Haworth**, Kenneth B. Bader, Kyle T. Rich, Christy K. Holland, T. Douglas Mast. (2017). Quantitative Frequency-Domain Passive Cavitation Imaging. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*. 64(1):177-191 doi: 10.1109/TUFFC.2016.2620492
3. Jonathan T. Sutton, **Kevin J. Haworth**, Shiva Kumar Shanmukhappa, Melanie R. Moody, Melvin R. Klegerman, Joseph K. Griffin, Daniella M. Patton, David D. McPherson, Christy K. Holland. (2016). Delivery of bevacizumab to atheromatous porcine carotid tissue using echogenic liposomes. *Drug Delivery*. 23(9):3594-3605 doi: 10.1080/10717544.2016.1212441
4. Kenneth B. Bader, **Kevin J. Haworth**, Himanshu Shekhar, Adam Maxwell, Tao Peng, David D. McPherson, Christy K. Holland. (2016). Efficacy of histotripsy combined with rt-PA in vitro. *Physics in Medicine and Biology*. 61(14):5253-5274 doi: 10.1088/0031-9155/61/14/5253
5. Karla P. Mercado, Kirithi Radhakrishnan, Kyle Stewart, Lindsay Snider, Devin Ryan, **Kevin J. Haworth**. (2016). Empirical model for size isolating ultrasound-triggered phase-shift emulsions using differential centrifugation. *Journal of the Acoustical Society of America - Express Letters*. 135(5):EL142-148 doi: 10.1121/1.4946831
6. Kirithi Radhakrishnan, Christy K. Holland, **Kevin J. Haworth**. (2016). Scavenging dissolved oxygen via acoustic droplet vaporization. *Ultrasonics Sonochemistry*. 31:394-403 doi: 10.1016/j.ultsonch.2016.01.019
7. **Kevin J. Haworth**, Jason L. Raymond, Kirithi Radhakrishnan, Melanie R. Moody, Shaoling Huang, Tao Peng, Himanshu Shekhar, Melvin E. Klegerman, Hyunggun Kim, David D. McPherson, and Christy K. Holland. (2016). Trans-stent B-mode ultrasound and passive cavitation imaging. *Ultrasound in Medicine and Biology*. 42(2):518-527 doi: 10.1016/j.ultrasmedbio.2015.08.014

Kevin J. Haworth, Jason L. Raymond, Kirithi Radhakrishnan, Melanie R. Moody, Shaoling Huang, Tao Peng, Himanshu Shekhar, Melvin E. Klegerman, Hyunggun Kim, David D. McPherson, and Christy K. Holland. (2016). Erratum to: "Trans-stent B-mode ultrasound and passive cavitation imaging." in *Ultrasound Med Biol*

2016;42(2):518-527. *Ultrasound in Medicine and Biology*. 42(5):1244
doi: 10.1016/j.ultrasmedbio.2016.01.016

8. Melvin E. Klegerman, Ali K. Naji, **Kevin J. Haworth**, Yuejiao Zou, Eva Golunski, Tao Peng, George L. Britton, Shao-Ling Huang, Christy K. Holland, David D. McPherson. (2016). Ultrasound-enhanced bevacizumab release from echogenic liposomes for inhibition of atheroma progression. *Journal of Liposome Research*. 26(1):47-56 doi: 10.3109/08982104.2015.1029494
9. **Kevin J. Haworth**, Vasant A. Salgaonkar, Nicholas M. Corregan, Christy K. Holland, T. Douglas Mast. (2015). Using passive cavitation images to classify high-intensity focused ultrasound lesions. *Ultrasound in Medicine and Biology*. 41(9):2420-2434 doi: 10.1016/j.ultrasmedbio.2015.04.025
10. **Kevin J. Haworth**, Christopher R. Weidner, Todd A. Abruzzo, Jason T. Shearn, Christy K. Holland. (2015). Mechanical properties and fibrin characteristics of endovascular coil-clot complexes: Relevance to endovascular cerebral aneurysm repair paradigms. *Journal of NeuroInterventional Surgery*. 7(4):291-296 doi: 10.1136/neurintsurg-2013-011076
11. Kirthi Radhakrishnan, **Kevin J. Haworth**, Shao-Ling Huang, David D. McPherson, Christy K. Holland. (2015). Loss of echogenicity and onset of cavitation from echogenic liposomes: Pulse repetition frequency independence. *Ultrasound in Medicine and Biology*. 41(1):208-221 doi: 10.1016/j.ultrasmedbio.2014.08.021
12. Jason L. Raymond, **Kevin J. Haworth**, Kenneth B. Bader, Kirthi Radhakrishnan, Joseph K. Griffin, Shao-Ling Huang, David D. McPherson, Christy K. Holland. (2014). Broadband attenuation measurements of phospholipid-shelled ultrasound contrast agents. *Ultrasound in Medicine and Biology*. 40(2):410-421 doi: 10.1016/j.ultrasmedbio.2013.09.018
13. Kirthi Radhakrishnan, Kenneth B. Bader, **Kevin J. Haworth**, Jonathan A. Kopechek, Jason L. Raymond, Bin Huang, Shao-Ling Huang, David D. McPherson, Christy K. Holland. (2013). Relationship between cavitation and loss of echogenicity from ultrasound contrast agents. *Physics in Medicine and Biology*. 58(18):6541-6563 doi: 10.1088/0031-9155/58/18/6541
14. Sheryl E. Koch, **Kevin J. Haworth**, Nathan Robbins, Margaret A. Smith, Navneet Lather, Ahmad Anjak, Min Jiang, Priyanka Varma, W. Keith Jones, and Jack Rubinstein. (2013). Age and gender related changes in myocardial function in wild type FVB/N mice as evaluated by conventional and vector velocity echocardiography imaging. *Ultrasound in Medicine and Biology*. 39(11):2034-2043 doi: 10.1016/j.ultrasmedbio.2013.04.002
15. Jonathan T. Sutton, **Kevin J. Haworth**, Gail J. Pyne-Geithman, Christy K. Holland. (2013). Ultrasound-mediated drug delivery for cardiovascular disease. *Expert Opinions on Drug Delivery*. 10(5):573-592 doi: 10.1517/17425247.2013.772578
16. Jonathan A. Kopechek, **Kevin J. Haworth**, Kirthi Radhakrishnan, Shao-Ling Huang, Melvin E. Klegerman, David D. McPherson, Christy K. Holland. (2013). The impact of microbubbles on measurement of drug release from echogenic liposomes. *Ultrasonics Sonochemistry*. 20(4):1121-1130 doi: 10.1016/j.ultsonch.2012.12.005
17. Robert Littleton, **Kevin J. Haworth**, Hong Tang, Kenneth Setchell, Sandra Nelson, Jay Hove. (2013). Automated in vivo platform for the discovery of functional food treatments of hypercholesterolemia in zebrafish. *PLoS ONE*. 8(1):e52409 1-9 doi: 10.1371/journal.pone.0052409
18. Kirthi Radhakrishnan, **Kevin J. Haworth**, Shao-Ling Huang, Melvin E. Klegerman, David D. McPherson, Christy K. Holland. (2012). Stability of echogenic liposomes as a blood pool ultrasound contrast agent in a physiologic flow phantom. *Ultrasound in Medicine and Biology*. 38(11):1970-1981 doi: 10.1016/j.ultrasmedbio.2012.06.012
19. **Kevin J. Haworth**, T. Douglas Mast, Kirthi Radhakrishnan, Mark T. Burgess, Jonathan A. Kopechek, Shao-Ling Huang, David D. McPherson, Christy K. Holland. (2012). Passive imaging with pulsed ultrasound insonations. *Journal of the Acoustical Society of America*. 132(1):544-553 doi: 10.1121/1.4728230

20. Jonathan A. Kopechek, **Kevin J. Haworth**, Jason L. Raymond, T. Douglas Mast, Stephen R. Perrin Jr., Melvin E. Klegerman, Shao-Ling Huang, Tyrone M. Porter, David D. McPherson, Christy K. Holland. (2011). Acoustic characterization of echogenic liposomes: frequency-dependent attenuation and backscatter. *Journal of the Acoustical Society of America*. 130(5, Pt. 2):3472-3481 doi: 10.1121/1.3626124
21. Man Zhang, Mario L. Fabiilli, **Kevin J. Haworth**, Frederic R. Padilla, Scott D. Swanson, Oliver D. Kripfgans, Paul L. Carson, J. Brian Fowlkes. (2011). Acoustic droplet vaporization for enhancement of thermal ablation by high intensity focused ultrasound. *Academic Radiology*. 18(9):1123-1132 doi: 10.1016/j.acra.2011.04.012
22. Kathryn E. Hitchcock, Nikolas M. Ivancevich, **Kevin J. Haworth**, Danielle N. Caudell, Deborah C. Vela, Jonathan T. Sutton, Gail J. Pyne-Geithman, Christy K. Holland. (2011). Ultrasound-enhanced rt-PA thrombolysis in an *ex vivo* porcine carotid artery model. *Ultrasound in Medicine and Biology*. 37(8):1240-1251, doi: 10.1016/j.ultrasmedbio.2011.05.011
23. Man Zhang, Mario L. Fabiilli, **Kevin J. Haworth**, J. Brian Fowlkes, Oliver D. Kripfgans, William W. Roberts, Kimberly A. Ives, Paul L. Carson. (2010). Initial investigation of acoustic droplet vaporization for occlusion in canine kidney. *Ultrasound in Medicine and Biology*. 36(10):1691-1703, doi: 10.1016/j.ultrasmedbio.2010.06.020
24. Mario L. Fabiilli, **Kevin J. Haworth**, Ian E. Sebastian, Oliver D. Kripfgans, Paul L. Carson, J. Brian Fowlkes. (2010). Delivery of chlorambucil using acoustically-triggered, perfluoropentane emulsions. *Ultrasound in Medicine and Biology*. 36(8):1364-1375, doi: 10.1016/j.ultrasmedbio.2010.04.019
25. **Kevin J. Haworth**, J. Brian Fowlkes, Paul L. Carson, Oliver D. Kripfgans. (2009). Generalized shot noise model for time-reversal in multiple-scattering media allowing for arbitrary inputs and windowing. *Journal of the Acoustical Society of America*. 125(5):3129-3140, doi: 10.1121/1.3106133

Kevin J. Haworth, J. Brian Fowlkes, Paul L. Carson, Oliver D. Kripfgans. (2010). Erratum: "Generalized shot noise model for time-reversal in multiple-scattering media allowing for arbitrary inputs and windowing" [J. Acous. Soc. Am. 125, 3129-3140 (2009)]. *Journal of the Acoustical Society of America*. 127(5):3273, doi: 10.1121/1.3372747
26. Mario L. Fabiilli, **Kevin J. Haworth**, Oliver D. Kripfgans, Paul L. Carson, J. Brian Fowlkes. (2009). The role of inertial cavitation in acoustic droplet vaporization. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*. 56(5):1006-1017, doi: 10.1109/TUFFFC.2009.1132
27. **Kevin J. Haworth**, J. Brian Fowlkes, Paul L. Carson, Oliver D. Kripfgans. (2008). Towards aberration correction of transcranial ultrasound using acoustic droplet vaporization. *Ultrasound in Medicine and Biology*. 34(3):435-445, doi: 10.1016/j.ultrasmedbio.2007.08.004

PROCEEDINGS
ARTICLES

1. **Kevin J. Haworth**, Bryan H. Goldstein, Karla P. Mercado-Shekhar, Rohan Srivastava, P. Arunkumar, Haili Su, Ellena M. Privitera, Christy K. Holland, Andrew N. Redington. (in press). Initial Growth of Ultrasonically Vaporized Perfluorocarbon Microdroplets. *2017 IEEE International Ultrasonics Symposium Proceedings*.
2. **Kevin J. Haworth**, Vasant A. Salgaonkar, Nicholas M. Corregan, Christy K. Holland, T. Douglas Mast. (2013). Spatial specificity and sensitivity of passive cavitation imaging for monitoring high-intensity focused ultrasound thermal ablation in ex vivo bovine liver. *Proceedings of Meetings on Acoustics*. 19:075022 doi: 10.1121/1.4800327
3. **Kevin J. Haworth**, Oliver D. Kripfgans. (2008). Initial Growth of Ultrasonically Vaporized Perfluorocarbon Microdroplets. *2008 IEEE International Ultrasonics Symposium Proceedings*. 1:623-626
4. **Kevin J. Haworth**, Mario L. Fabiilli, J. Brian Fowlkes, Man Zhang, Oliver D. Kripfgans, William W. Roberts, Paul L. Carson. (2008). Mean Echo Power as a Measure of Flow Reduction for Bubble Occlusion Therapy. *2008 IEEE International Ultrasonics Symposium Proceedings*. 1:768-771
5. Mario L. Fabiilli, **Kevin J. Haworth**, Oliver D. Kripfgans, Paul L. Carson, J. Brian Fowlkes. (2008). The Role of Inertial Cavitation in Acoustic Droplet Vaporization. *2008 IEEE International Ultrasonics Symposium Proceedings*. 1:776-779

CONFERENCE
PRESENTATIONS
AND ABSTRACTS
*trainees denoted
by underline*

1. Haili Su, Karla P. Mercado-Shekhar, Sneha Sharma, Bin Zhang, **Kevin J. Haworth**. “Modulating the partial pressure of oxygen using acoustic droplet vaporization.” 2018 American Institute of Ultrasound in Medicine Annual Convention, 24-28 March 2018, New York, New York, USA.
2. Melanie R. Moody, Shao-Ling Huang, Hyunggun Kim, Xing Yin, Tao Peng, Susan T Laing, Melvin E Klegerman, Curtis Genstler, **Kevin J. Haworth**, Christy K. Holland, David D. McPherson, Patrick Kee. “Stabilizing Peri-stent Restenosis Using a Novel Therapeutic Carrier.” 2017 American Heart Association Scientific Sessions, 11-15 November 2017, Anaheim, CA, USA. *Circulation* 136(Suppl 1):A17293.
3. **Kevin J. Haworth** Bryan Goldstein, Karla Mercado-Shekhar, Christy K. Holland, Andrew N. Redington, “Dissolved Oxygen Scavenging by Acoustic Droplet Vaporization using Intravascular Ultrasound.” 2017 IEEE International Ultrasonics Symposium, 6-9 September 2017, Washington D.C., USA.
4. Karla P. Mercado, Deepak S. Kalaikadal, John N. Lorenz, Raj M. Manglik, Christy K. Holland, Andrew N. Redington, **Kevin J. Haworth**, “Effect of Diluent Fluid Viscosity on Acoustic Droplet Vaporization-Mediated Dissolved Oxygen Scavenging.” Acoustics '17: joint meeting of the 173rd Meeting of the Acoustical Society of America and the 8th Forum Acusticum, 25-29 June 2017, Boston, Massachusetts, USA.
5. Shima H. Abadi, **Kevin J. Haworth**, Karla P. Mercado, David R. Dowling, “Using Frequency-sum Beamforming in Passive Cavitation Imaging.” Acoustics '17: joint meeting of the 173rd Meeting of the Acoustical Society of America and the 8th Forum Acusticum, 25-29 June 2017, Boston, Massachusetts, USA.
6. Christy K. Holland, **Kevin J. Haworth**, T. Douglas Mast, “Biomedical Research at the Image-guided Ultrasound Therapeutics Laboratories.” Acoustics '17: joint meeting of the 173rd Meeting of the Acoustical Society of America and the 8th Forum Acusticum, 25-29 June 2017, Boston, Massachusetts, USA.
7. Eric Mahoney, Husuan-Yeh Pan, Karla Mercado, **Kevin J. Haworth**, Yoonjee Park, Chia-Ying Lin, “Release of Simvastatin to Treat Degenerative Disc Disease using Nanodroplet Targeted Ultrasound.” Orthopaedic Research Society 2017 Annual Meeting, 19-22 March 2017, San Diego, California, USA.

8. Karla Mercado, Kirthi Radhakrishnan, Christy K. Holland, **Kevin J. Haworth**, “Reduction in dissolved oxygen resulting from acoustic droplet vaporization.” 22nd European Symposium on Ultrasound Contrast Imaging, 19-20 January 2017, Rotterdam, The Netherlands.
9. Kenneth B. Bader, **Kevin J. Haworth**, Adam D. Maxwell, Christy K. Holland, “Comparison of passive cavitation imaging and plane wave B-mode imaging for monitoring histotripsy ablation.” 5th Joint Meeting of the Acoustical Society of America and the Acoustical Society of Japan, 28 November - 2 December 2016, Honolulu, Hawaii, USA.
10. Yoonjee Park, Madison Taylor, Zhe Zhang, Courtney Collins, Hsuan-Yeh Pan, Eric Mahoney, Karla Mercado, **Kevin J. Haworth**, Chia-Ying Lin, “Stable Nanodroplets for Controlled Drug Release and Monitoring Using Ultrasound.” Biomedical Engineering Society Annual Meeting, 5-8 October 2016, Minneapolis, Minnesota, USA.
11. Kenneth B. Bader, **Kevin J. Haworth**, Adam D. Maxwell, Christy K. Holland, “Monitoring histotripsy ablation with passive cavitation imaging.” 5th International Symposium on Focused Ultrasound, 28 August - 1 September 2016, North Bethesda, Maryland, USA.
12. Shima H. Abadi, David C. Leckta, Karla P. Mercado, **Kevin J. Haworth**, David D. Dowling, “Frequency-sum beamforming in a random scattering environment.” 170th Meeting of the Acoustical Society of America, 2-6 November 2015, Jacksonville, Florida, USA.
13. Kenneth B. Bader, **Kevin J. Haworth**, Adam D. Maxwell, Tao Peng, David D. McPherson, Christy K. Holland, “Fibrin-targeted echogenic liposomes for localized ablation of thrombi with histotripsy pulses.” 170th Meeting of the Acoustical Society of America, 2-6 November 2015, Jacksonville, Florida, USA.
14. Karla P. Mercado, Lindsay Snider, Kirthi Radhakrishnan, **Kevin J. Haworth**, “An empirical model of size-isolated ultrasound-triggered phase shift emulsions.” 170th Meeting of the Acoustical Society of America, 2-6 November 2015, Jacksonville, Florida, USA.
15. Kyle Stewart, Kirthi Radhakrishnan, **Kevin J. Haworth**, “Towards monodisperse ultrasound-triggered phase-shift emulsions using differential centrifugation.” 169th Meeting of the Acoustical Society of America, 18-22 May 2015, Pittsburgh, Pennsylvania, USA.
16. **Kevin J. Haworth**, Kirthi Radhakrishnan, Karla P. E. Mercado, Kyle Stewart, Christy K. Holland, “Ultrasound-mediated scavenging of dissolved oxygen.” Translational Science 2015, 16-18 April 2015, Washington, DC, USA.
17. Kirthi Radhakrishnan, Christy K. Holland, **Kevin J. Haworth**, “Scavenging dissolved oxygen via acoustic droplet vaporization.” 168th Meeting of the Acoustical Society of America, 27-31 October 2014, Indianapolis, Indiana, USA.
18. Christy K. Holland, T. Douglas Mast, **Kevin J. Haworth**, Kenneth B. Bader, Himanshu Shekhar, “Biomedical research at the image-guided ultrasound therapeutics laboratories.” 168th Meeting of the Acoustical Society of America, 27-31 October 2014, Indianapolis, Indiana, USA.
19. **Kevin J. Haworth**, Kirthi Radhakrishnan, T. Douglas Mast, “Frequency-sum passive cavitation imaging.” 167th Meeting of the Acoustical Society of America, 5-9 May 2014, Providence, Rhode Island, USA.
20. Kenneth B. Bader, Kirthi Radhakrishnan, **Kevin J. Haworth**, Jason L. Raymond, Shao-Ling Huang, Tao Peng, David D. McPherson, Christy K. Holland, “Modeling the loss of echogenicity from ultrasound contrast agents.” 166th Meeting of the Acoustical Society of America, 2-6 December 2013, San Francisco, California, USA.
21. Jonathan T. Sutton, Kirthi Radhakrishnan, Jason L. Raymond, Kenneth B. Bader, Guillaume Bouchoux, **Kevin J. Haworth**, Gail Pyne-Geithman, Christy K. Holland, “Ultrasound-mediated drug delivery for the treatment of cardiovascular disease.” American Association of Physicists in Medicine: 55th Annual Meeting and Exhibition, 4-8 August 2013, Indianapolis, Indiana, USA.

22. **Kevin J. Haworth**, Vasant A. Salgaonkar, Nicholas M. Corregan, Christy K. Holland, T. Douglas Mast, “Spatial specificity and sensitivity of passive cavitation imaging for monitoring high-intensity focused ultrasound thermal ablation in *ex vivo* bovine liver.” Joint meeting of the 21st International Congress on Acoustics and the Acoustical Society of America, 2-7 June 2013, Montréal, Québec, Canada. *Journal of the Acoustical Society of America*. 133(5):3263
23. Jason L. Raymond, **Kevin J. Haworth**, Kenneth B. Bader, Kirthi Radhakrishnan, Shao-Ling Huang, David D. McPherson, and Christy K. Holland, “Broadband Attenuation and Size Measurements of Ultrasound Contrast Agents.” 14th World Congress of Ultrasound in Medicine and Biology, 2-5 May 2013 São Paulo, Brazil
24. **Kevin J. Haworth**, T. Douglas Mast, Kirthi Radhakrishnan, Christy K. Holland, “Effect of inter-element apodization on passive cavitation images.” 164th Meeting of the Acoustical Society of America, 25 October 2012, Kansas City, Missouri, USA. *Journal of the Acoustical Society of America*. 132(3, Pt2):2038
25. Kirthi Radhakrishnan, **Kevin J. Haworth**, Jonathan A. Kopechek, Bin Huang Shao-Ling Huang, David D. McPherson, Christy K. Holland, “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, 25 October 2012, Kansas City, Missouri, USA. *Journal of the Acoustical Society of America*. 132(3, Pt2):2037
26. **Kevin J. Haworth**, T. Douglas Mast, Kirthi Radhakrishnan, Jonathan A. Kopechek, Mark T. Burgess, Shao-Ling Huang, David D. McPherson, Christy K. Holland, “Passive cavitation imaging of echogenic liposomes insonified with 6 Megahertz pulsed Doppler ultrasound in a flow phantom.” 161st Meeting of the Acoustical Society of America, 25 May 2011, Seattle, Washington, USA. *Journal of the Acoustical Society of America*. 129(4):2513
27. Nikolas M. Ivancevich, **Kevin J. Haworth**, Kathryn E. Hitchcock, Christy K. Holland, “Determination of optimal ultrasound parameters for *ex vivo* sonothrombolysis.” 2nd Pan-American/Iberian Meeting on Acoustics joint with the 160th Meeting of the Acoustical Society of America, 15-19 November 2010, Cancun, Mexico. *Journal of the Acoustical Society of America*. 128(4):2440-2441
28. Kathryn E. Hitchcock, Nikolas M. Ivancevich, **Kevin J. Haworth**, Danielle N. Caudell Stamper, Deborah Vela, Jonathan T. Sutton, Gail J. Pyne-Geithman, and Christy K. Holland, “Ultrasound-enhanced thrombolysis in an *ex vivo* porcine carotid artery model.” 2nd Pan-American/Iberian Meeting on Acoustics joint with the 160th Meeting of the Acoustical Society of America, 15-19 November 2010, Cancun, Mexico. *Journal of the Acoustical Society of America*. 128(4):2440
29. Mario L. Fabiilli, Oliver D. Kripfgans, Man Zhang, **Kevin J. Haworth**, Andrea H. Lo, Paul L. Carson, J. Brian Fowlkes, “Applications of acoustic droplet vaporization in diagnostic and therapeutic ultrasound.” 159th Meeting of the Acoustical Society of America, 19-23 April 2010, Baltimore, Maryland, USA. *Journal of the Acoustical Society of America*. 127(3):1976
30. Kirthi Radhakrishnan, Jonathan A. Kopechek, **Kevin J. Haworth**, Shao-Ling Huang, David D. McPherson, Christy K. Holland, “Relationship between cavitation, rapid loss of echogenicity, and drug release from echogenic liposomes.” 159th Meeting of the Acoustical Society of America, 19-23 April 2010, Baltimore, Maryland, USA. *Journal of the Acoustical Society of America*. 127(3):1975
31. Man Zhang, Mario L. Fabiilli, **Kevin J. Haworth**, Scott D. Swanson, Frederic Padilla, Oliver D. Kripfgans, Paul L. Carson, J. Brian Fowlkes, “Acoustic droplet vaporization for enhancement of high-intensity focused ultrasound therapy.” 2010 American Institute of Ultrasound in Medicine Annual Convention. 24-27 March 2010, San Diego, California, USA
32. Paul L. Carson, Man Zhang, Mario L. Fabiilli, Oliver D. Kripfgans, **Kevin J. Haworth**, William W. Roberts, J. Brian Fowlkes, “Acoustic droplet vaporization for thermal therapies.” 158th Meeting of the Acoustical Society of America, 26-30 October 2009, San Antonio, Texas, USA. *Journal of the Acoustical Society of America*. 126(4):2176

33. Mario L. Fabiilli, Ian E. Sebastian, **Kevin J. Haworth**, Oliver D. Kripfgans, Paul L. Carson, J. Brian Fowlkes, “Ultrasonic delivery of a chemotherapeutic agent using acoustic droplet vaporization (ADV).” 2009 IEEE International Ultrasonics Symposium. 20-23 September 2009, Rome, Italy.
34. Man Zhang, Scott D. Swanson, **Kevin J. Haworth**, Mario L. Fabiilli, Oliver D. Kripfgans, Paul L. Carson, J. Brian Fowlkes, “Acoustic droplet vaporization for enhancement of high intensity focused ultrasound thermal ablation.” 51st American Association of Physicists in Medicine Annual Meeting. 26-30 July 2009, Anaheim, California, USA
35. Man Zhang, Mario L. Fabiilli, **Kevin J. Haworth**, J. Brian Fowlkes, Oliver D. Kripfgans, William W. Roberts, Kimberly A. Ives, Paul L. Carson, “Localized Tissue Occlusion by Acoustically Vaporized Droplets.” 2009 American Institute of Ultrasound in Medicine Annual Convention. 2-5 April 2009, New York City, New York, USA
36. Wenjin Cui, Xucai Chen, Jianjun Wang, Andrew Fisher, Kang Kim, Andrew Carson, Oliver D. Kripfgans, **Kevin J. Haworth**, William R. Wagner, Flordeliza S. Villanueva. “A New Method for Stem Cell Imaging Using Contrast Ultrasound.” American Heart Association Scientific Sessions. 8-12 November 2008, New Orleans, Louisiana, USA. *Circulation*. 118(18):S642
37. Man Zhang, Mario L. Fabiilli, **Kevin J. Haworth**, J. Brian Fowlkes, Oliver D. Kripfgans, William W. Roberts, Kimberly A. Ives, Paul L. Carson, “Localized Tissue Occlusion by Acoustically Vaporized Droplets.” 2008 GLC-AAPM Young Investigators and Licensure Symposium. 6 November 2008, Brighton, Michigan, USA
38. **Kevin J. Haworth**, Oliver D. Kripfgans. “Initial Growth of Ultrasonically Vaporized Perfluorocarbon Microdroplets.” 2008 IEEE International Ultrasonics Symposium. 2-5 November 2008, Beijing, China. *2008 IEEE IUS Proceedings*. 1:623-626
39. **Kevin J. Haworth**, Mario L. Fabiilli, J. Brian Fowlkes, Man Zhang, Oliver D. Kripfgans, William W. Roberts, Paul L. Carson. “Mean Echo Power as a Measure of Flow Reduction for Bubble Occlusion Therapy.” 2008 IEEE International Ultrasonics Symposium. 2-5 November 2008, Beijing, China. *2008 IEEE IUS Proceedings*. 1:768-771
40. Mario L. Fabiilli, **Kevin J. Haworth**, Oliver D. Kripfgans, Paul L. Carson, J. Brian Fowlkes. “The Role of Inertial Cavitation in Acoustic Droplet Vaporization.” 2008 IEEE International Ultrasonics Symposium. 2-5 November 2008, Beijing, China. *2008 IEEE IUS Proceedings*. 1:776-779
41. Mario L. Fabiilli, **Kevin J. Haworth**, J. Brian Fowlkes, Paul L. Carson, Oliver D. Kripfgans. “Acoustically Triggered Embolo and Chemo Therapy for Treatment of Prostate Cancer.” 12th Asian Oceanian Congress of Radiology. 24-28 October 2008, Seoul, Korea
42. Man Zhang, **Kevin J. Haworth**, J. Brian Fowlkes, Mario L. Fabiilli, Oliver D. Kripfgans, William W. Roberts, Paul L. Carson, “Superselective Tissue Occlusion by Acoustic Droplet Vaporization (ADV).” 2008 International Symposium on Therapeutic Ultrasound (ISTUS). 10-13 September 2008, Minneapolis, Minnesota, USA
43. Mario L. Fabiilli, **Kevin J. Haworth**, Man Zhang, Oliver D. Kripfgans, J. Brian Fowlkes, William W. Roberts, Kimberly Ives, Paul L. Carson, “Vascular occlusion by acoustically vaporized droplets for potential targeted enhancement of thermal therapies.” 50th American Association of Physicists in Medicine Annual Meeting. 27-31 July 2008, Houston, Texas, USA
44. **Kevin J. Haworth**, J. Brian Fowlkes, Paul L. Carson, Oliver D. Kripfgans, “Modeling time-reversal focusing in a multiple scattering medium.” Acoustics ‘08: Acoustical Society of America and European Acoustics Association joint meeting. 31 June - 4 July 2008, Paris, France. *Journal of the Acoustical Society of America*. 125(5 pt2):3341
45. Man Zhang, Mario L. Fabiilli, **Kevin J. Haworth**, Oliver D. Kripfgans, J. Brian Fowlkes, William W. Roberts, Paul L. Carson, “Image-guided Acoustic Droplet Vaporization (ADV) for Tissue Occlusion.” NIH Workshop on Clinical Image-Guided Therapy: Opportunities and Needs. 10-11 March 2008, Rockville, Maryland, USA

46. **Kevin J. Haworth**, J. Brian Fowlkes, Paul L. Carson, Oliver D. Kripfgans, “Application of Acoustic Droplet Vaporization for Point-target Based Transcranial Aberration Correction.” 7th International Symposium on Therapeutic Ultrasound. 13 June 2007, Seoul, Korea
47. **Kevin J. Haworth**, Oliver D. Kripfgans, J. Brian Fowlkes, Paul L. Carson, “Pulse Length Dependence for Acoustic Time Reversal.” Radiological Society of North America. 29 November 2006, Chicago, Illinois, USA, *RSNA Scientific Assembly Program*. 92:469
48. Derek D. Steele, **Kevin J. Haworth**, Oliver D. Kripfgans, and Scott D. Swanson, “Three-Dimensional Visualization of Ultrasonically-Induced Shear Waves for Elasticity Imaging.” International Society for Magnetic Resonance in Medicine 14th Scientific Meeting. 10 May 2006, Seattle, Washington, USA
49. Oliver D. Kripfgans, **Kevin J. Haworth**, Derek D. Steele, Scott D. Swanson. “Magnetic Resonance Elastography using Time Reversed Acoustics.” SPIE Medical Imaging 2005: Physiology, Function, and Structure from Medical Images. 12 February 2005, San Diego, California, USA. *Proceedings of SPIE: Medical Imaging*. 5746:1-10
50. **Kevin J. Haworth**, Oliver D. Kripfgans, and Paul L. Carson, “Time-Reversal Acoustics with a Chaotic Cavity: Ultrasound of the Brain.” Great Lakes Chapter of the American Association of Physicists in Medicine: Young Investigators & Image-Guided Therapy Symposium. 5 Novembers 2005, Birmingham, Michigan, USA
51. **Kevin J. Haworth**, Oliver D. Kripfgans, Derek D. Steele, Scott Swanson., “Acoustically induced tissue displacement for shear wave elasticity imaging using MRI.” 150th Meeting of the Acoustical Society of America held jointly with the Institute for Noise Control Engineering, 19 October 2005, Minneapolis, Minnesota, USA. *Journal of the Acoustical Society of America*. 118(3 pt2):1942
52. **Kevin J. Haworth** and Michael Goggin “Determining Semi-Classical Trajectories for Simple Quantum Events.” Undergraduate Research Conference -Truman State University, 10 April 2003, Kirksville, Missouri, USA
53. **Kevin J. Haworth** and Heather Mollé, “Exploring Photonic Band Gap Crystals,” Society of Physics Students Zone 12 Fall Meeting, 16 November 2002, Springfield, Missouri, USA
54. Lynne F. Zielinski, **Kevin J. Haworth**, Jason Georgacakis, and Kurt Landeweer, “The Growth and Development of Mosquitoes in a Microgravity Environment,” 1999 Shuttle Small Payloads Symposium, 13-15 September 1999, Annapolis, Maryland, USA, NASA/CP-1999-209476:49-56
55. Lynne F. Zielinski, Vince Pinelli, **Kevin J. Haworth**, Patrick Kearney, and Keun Young Lee, “Surface Tension: The Art of Science,” 1999 Shuttle Small Payloads Symposium, 13-15 September 1999, Annapolis, Maryland, USA, NASA/CP-1999-209476:57-64

INVITED TALKS

1. **Kevin J. Haworth**, “The Ins and Outs of Cavitation Monitoring and Imaging.” EKOS Corp., 26 October 2017, Bothell, Washington, USA.
2. **Kevin J. Haworth**, “Seeing and Hearing Is Believing: Development and Application of Passive Cavitation Imaging for Guiding Cavitation-based Therapies.” University of Michigan Department of Radiology Ultrasound Group Seminar, 3 October 2017, Ann Arbor, Michigan, USA.
3. **Kevin J. Haworth**, Kenneth B. Bader, Kyle T. Rich, Christy K. Holland, T. Douglas Mast, “Frequency-Domain Passive Cavitation Imaging.” Acoustics '17: joint meeting of the 173rd Meeting of the Acoustical Society of America and the 8th Forum Acusticum, 25-29 June 2017, Boston, Massachusetts, USA.
4. **Kevin J. Haworth**, “Overview of Cavitation Monitoring, Imaging, and Analysis.” 2017 American Institute of Ultrasound in Medicine Annual Convention, 25-29 March 2017, Orlando, Florida, USA.

5. **Kevin J. Haworth**, “The Case of the Missing Oxygen (and Other Adventures in Ultrasound),” 29 September 2016, University of Louisville Bioengineering Seminar Series, Louisville, Kentucky, USA
6. **Kevin J. Haworth**, “That’s Not My Hypothesis: Ultrasound-mediated O₂ Scavenging,” 25 March 2016, Cincinnati Center for Clinical and Translational Science Grand Rounds, Cincinnati, Ohio, USA
7. **Kevin J. Haworth**, “Ultrasound-mediated O₂ scavenging,” 11 June 2015, Przyklenk Laboratory, Wayne State University, Detroit, Michigan, USA
8. **Kevin J. Haworth**, “From Clots to Microbubbles to Imaging and Back,” 26 January 2015, Heart, Lung and Vascular Institute Seminar Series, University of Cincinnati, Cincinnati, Ohio, USA
9. **Kevin J. Haworth**, “Not All Clots Are Created Equally,” 20 November 2014, Department of Internal Medicine Research Conference, University of Cincinnati, Cincinnati, Ohio, USA
10. **Kevin J. Haworth**, “The Case of the Missing Oxygen,” 18 November 2014, Division of Cardiovascular Health and Disease Grand Rounds, University of Cincinnati, Cincinnati, Ohio, USA
11. **Kevin J. Haworth**, “Arrays and Microbubbles in Medical Ultrasound Applications,” 9 October 2012, Department of Physics, University of Mississippi, Oxford, Mississippi, USA
12. **Kevin J. Haworth**, “Ultrasound-Mediated Microbubble Bioeffects: Production, Induction, and Optimization,” 27 February 2012, Department of Mechanical Engineering, Boston University, Boston, Massachusetts, USA
13. **Kevin J. Haworth**, “Passive Cavitation Imaging for Ultrasound Therapies,” 6 April 2011, Department of Mechanical Engineering, University of California - Riverside, Riverside, California, USA
14. **Kevin J. Haworth**, “Passive Cavitation Imaging: a New Technique for Optimization and Guidance of Microbubble-Based Ultrasound Therapies,” 23 February 2011, Institute of Imaging Science, Vanderbilt University, Nashville, Tennessee, USA
15. **Kevin J. Haworth**, “The Importance of the When and Where of Cavitation,” 24 September 2010, Ultrasound Group, Basic Radiological Sciences Division, Department of Radiology, University of Michigan, Ann Arbor, Michigan, USA
16. **Kevin J. Haworth**, “Acoustic Droplet Vaporization and Ultrasonic Aberration Correction,” 27 February 2009, Ultrasound Research Laboratory, University of Cincinnati, Cincinnati, Ohio, USA
17. **Kevin J. Haworth**, “Acoustic Droplet Vaporization and Ultrasonic Aberration Correction,” 6 March 2009, Biomedical Ultrasonics and Biotherapy Laboratory, University of Oxford, Oxford, United Kingdom

INVENTIONS AND PATENTS

1. Christy K. Holland, Saurabh Datta, T. Douglas Mast, Nikolas Ivancevich, Kathryn E. Hitchcock, and **Kevin Haworth**, “Ultrasound-Mediated Inducement, Detection, and Enhancement of Stable Cavitation,” United States Patent 9,675,820, issued 13 June 2017
2. Christy K. Holland, Kathryn E. Hitchcock, **Kevin Haworth**, Nikolas Ivancevich, and T. Douglas Mast, “Methods of Enhancing Delivery of Drugs Using Ultrasonic Waves and Systems for Performing the Same,” United States Patent 9,669,203, issued 6 June 2017
3. Kirthi Radhakrishnan, Christy K. Holland, **Kevin J. Haworth**, “Scavenging Dissolved Oxygen via Acoustic Droplet Vaporization,” WO2017035454A1, Application number PCT/US2016/048934, filed August 26, 2016, priority date August 26, 2015.

4. **Kevin J. Haworth**, Christy K. Holland, Karla Mercado-Shekhar, Andrew Redington, Bryan Goldstein, "Dissolved Oxygen Scavenging by Acoustic Droplet Vaporization Using Intravascular Ultrasound," U.S. Provisional Patent Application Application No. 62509313 filed 22 May 2017.

HONORS AND
RECOGNITIONS

Professional

- 2013 - present Advisory Editorial Board Member, *Ultrasound in Medicine & Biology*
 2017 Early-career Travel Award, Acoustical Society of America
 2016 Early-career Acousticians Retreat Award, Acoustical Society of America
 2013 International Congress on Acoustics Young Scientist Conference Award

Postdoctoral

- 2010 - 2012 Ruth L. Kirschstein National Research Service Award (NIH/F32)

Graduate

- 2008 - 2009 Rackham Predoctoral Fellowship
 2008 IEEE Ultrasonics Symposium Student Travel Award
 2008 Office of Naval Research Travel Award
 2008 Physical Acoustics Summer School Scholarship
 2005 - 2008 Rackham Graduate School Travel Award
 2005 Applied Physics Program, Preliminary Exam - Pass with Distinction
 2003 - 2005 Applied Physics Fellowship
 2003 - 2004 Phi Kappa Phi Graduate Fellowship

Undergraduate

- 2003 Outstanding Student in Physics
 2003 Phi Beta Kappa
 2003 Sigma Pi Sigma Undergraduate Research Award
 2002 Phi Kappa Phi
 2002 Summer Undergrad. Research Fellowship, National Institute of Standards and Tech.
 2001 Sigma Pi Sigma
 2001 - 2003 Barry M. Goldwater Scholar
 1999 - 2003 Truman State Presidential Scholarship
 1999 - 2000 Truman State Undergraduate Research Scholarship

Precollegiate

- 1999 NASA-NSIP Aeronautics & Space Science Journalism Contest, 1st Place Nationally
 1999 Glenbrook North HS Outstanding Student in Science Scholarship
 1999 Glenbrook North HS Outstanding Physics Student Award
 1998 NASA-NSTA Space Station Aerospace Internship, 2nd Place Nationally
 1998, 1999 Illinois State Scholar

TEACHING
EXPERIENCE

University of Cincinnati

Program Affiliations

Biomedical Engineering Programs

- Graduate Teaching
- Undergraduate Teaching
- Secondary Faculty Appointment

Medical Sciences Undergraduate Program

- Teaching
- Program Committee
- Curriculum Subcommittee

Courses

Introduction to Biomedical Engineering in the Clinical Environment (BME 2000)

- Co-taught (fall semester), 2012-2017
- Quarter to semester conversion, Summer 2012
- Guest lecturer (Ethics, Library Resources, and Scientific Presentation), Fall 2010 & Fall 2011
- Course redesign, Summer 2011

Medical Sciences Junior Seminar on Medical Devices (MEDS3000)

- Designed and taught, Fall 2017

Biomedical Ultrasound (BME 6010):

- Lectures on Wave Propagation, Pulse-Echo Imaging Systems: software, signal processing, and image processing, Nonlinear Acoustics & Imaging, and Mechanical Destruction of Tissue; Laboratory on ultrasound B-mode, plane-wave, and pulse-inversion imaging, spring 2017
- Lectures on Attenuation & Absorption, Nonlinear Acoustics & Imaging, and Pulse-Echo Imaging Systems: software, signal processing, and image processing, spring 2015
- Designed and lead laboratory on ultrasound B-mode, plane-wave, and pulse-inversion imaging, spring 2015
- Lectures on Attenuation & Absorption, Nonlinear Acoustics & Imaging, and Mechanical Tissue Bioeffects of Ultrasound, Spring 2013

Special Topics in Biomedical Engineering (BME 5099)

- Research Experience, Summer 2013 (Stacy Loushin, Kyle Stewart, Hannah Grossman, Joshua Haines),
- MATLAB Instrument Control and GUI Development, Fall 2014 (Beryl Smith)
- Ultrasound and Hemolysis Research Experience, Summer 2016 (Austin Wanek)
- Ultrasound Elastography Research Experience, Summer 2016 (Nathan Perry)

Compilation of Student Evaluations (scale of 5 - 1 with 5 being excellent).

Semester/ Year	Level	Course Title and Number	Number Students	Average Course & Prof. Eval.	College Ave. Course & Prof. Eval.
Fall 2016	UG	Intro. to BME in the Clinical Environment, BME 2000	92	4.3 & 4.3	3.9 & 4.0
Fall 2015	UG	Intro. to BME in the Clinical Environment, BME 2000	75	3.6 & 4.2	3.8 & 4.0
Fall 2014	UG	Intro. to BME in the Clinical Environment, BME 2000	72	3.9 & 4.4	3.8 & 3.9
Fall 2013	UG	Intro. to BME in the Clinical Environment, BME 2000	55	4.1 & NA	3.9 & NA
Fall 2012	UG	Intro. to BME in the Clinical Environment, BME 2000	49	4.0 & NA	3.9 & NA

Seminars and Guest Lectures

Ultrasound Physics: Four part seminar series for Cardiology Fellows' Echocardiography Conference, Summer 2013, Summer 2014, Summer 2015, Summer 2016, Summer 2017

Ultrasound Physics: Five part seminar series for Summer Undergraduate Research Students, Summer 2016, Summer 2017

Exploring Biomedical Research (UC Honors Program): 'Image-guided Ultrasound Therapeutics Laboratories Introduction: Lecture, Tour, and Hands-on Demonstrations,' Spring 2015, Spring 2016

Academic-Year REU Seminar Program: 'Effective Technical Writing and Presenting', September 2014 & February 2015

Biomedical Engineering Graduate Student Seminar Series and Survey Course:

- ‘The Case of the Missing Oxygen,’ 2017
- ‘The Case of the Missing Oxygen,’ 2016
- ‘Ultrasound-Mediated Microbubble Bioeffects: Production, Induction, and Optimization,’ 2015
- ‘Ultrasound-Mediated Microbubble Bioeffects: Production, Induction, and Optimization,’ 2014
- ‘Ultrasound-Mediated Microbubble Bioeffects: Production, Induction, and Optimization,’ 2013
- ‘Ultrasound Microbubble Bioeffects,’ Spring 2012
- ‘Ultrasound-Mediated Microbubble Bioeffects: Production, Induction, and Optimization,’ 2012

Biomedical Engineering Career Building Blocks (BME 703): Guest lectures on Scientific Presentation Techniques & Academic and Industrial Interview Process, Spring 2011

Micro- and Nano-scale Biological Physics (BME 685): Two-Series Guest Lectures on Medical Ultrasound Fundamentals and Therapeutics, May 2010

Image-guided Ultrasound Research Laboratories Journal Club, Organizer, 2009 - 2015

University of Michigan

Introductory Physics Laboratory Upgrade Assistant, January 2005 - April 2005

Private Mathematics and Physics Tutor, 2004 - 2008

Truman State University

Physics Tutor, 2000 - 2003

Physics Laboratory Teaching Assistant, August 2001 - December 2001

Physics Demonstration Room Assistant, August 2000 - May 2001

MENTORING

Postdoctoral Fellows

<i>Trainee</i>	<i>Dates</i>	<i>Role as Mentor</i>	<i>Current Position</i>
Haili Su, MD, PhD UC Internal Medicine	09/2016- present	Primary Research Advisor	current
Karla Mercado, PhD UC Internal Medicine	12/2014- 09/2016 09/2016- present	Primary Research Advisor Research Mentor	current
ArunKumar Palaniappan, PhD UC Internal Medicine	11/2016- present	Research Mentor	current
Perwez Alam, PhD UC Internal Medicine	06/2016- present	Research Mentor	current
Kirthi Radhakrishnan, PhD UC Internal Medicine	12/2013- 02/2015	Primary Research Advisor	Ultrasound Engineer Philips Healthcare

Graduate Students

<i>Trainee</i>	<i>Dates</i>	<i>Role as Mentor</i>	<i>Current Position</i>
Robert Kleven UC Biomedical Engineering	1/2017- present	PhD Dissertation Committee	Graduate Student
Michael Cox UC Biomedical Engineering	9/2017- present	PhD Dissertation Committee	Graduate Student
Sara Zullino Univ. of Torino	10/2017- present	External PhD Thesis Referee	Graduate Student
Shenwen Huang UC Biomedical Engineering	1/2016- 8/2017	PhD Dissertation Committee	Medical Student
Kyle T. Rich UC Biomedical Engineering	5/2016- 5/2017	PhD Dissertation Committee	Officer and Fraud Strategy Analyst, Senior Fifth Third Bank
Jason L. Raymond UC Biomedical Engineering	9/2009- 5/2015	Secondary Research Mentor (PhD)	Postdoctoral Fellow Oxford University
Jonathan T. Sutton UC Biomedical Engineering	3/2012- 6/2014	Secondary Research Mentor (PhD)	Research Staff Scientist Philips Healthcare
John Lawrence UC Biomedical Engineering	6/2012- 12/2013	Primary Research Advisor (PhD)	Technical Services Specialist Epic Health Records
Kirthi Radhakrishnan, PhD UC Biomedical Engineering	9/2009- 11/2013	Secondary Research Mentor (PhD)	Ultrasound Engineer Philips Healthcare
Robert Littleton, PhD UC Systems Biol. and Phys.	3/2012- 9/2012	Secondary Research Mentor (PhD)	Healthcare Data Analyst CoverMyMeds
Jonathan A. Kopechek, PhD UC Biomedical Engineering	9/2009- 8/2011	Secondary Research Mentor (PhD)	Assistant Professor University of Louisville
Kathryn Hitchcock, MD, PhD UC Physician-Scientist Training Program and Biomed. Engineer.	9/2009- 8/2011	Secondary Research Mentor (PhD)	Chief Resident Radiation Oncology University of Florida
Christopher R. Weidner UC Biomedical Engineering	9/2011- 8/2013	Secondary Research Mentor (MS)	Consulting Analyst at Accenture

Medical Students

<i>Trainee</i>	<i>Dates</i>	<i>Role as Mentor</i>	<i>Current Position</i>
Maegan Lee UC COM	6/2015- 7/2015	Primary Research Advisor	Medical Student University of Cincinnati
Vincent Huang UC COM	6/2016- 20/2016	UC ROSE Program Research Advisor	Medical Student. University of Cincinnati

Undergraduate Students

<i>Trainee</i>	<i>Dates</i>	<i>Role as Mentor</i>	<i>Current Position</i>
Niusha Jahanpanah UC Medical Sciences	9/2016- present	Primary Research Advisor	Med Sci Undergraduate University of Cincinnati
Ellena Privitera UC Medical Sciences	5/2017- present	Primary Research Advisor	Med Sci Undergraduate University of Cincinnati
Hunter Palcich UC Biomedical Engineering	5/2017- 8/2017 9/2017- Present	Co-op Advisor Primary Research Advisor	BME Undergraduate University of Cincinnati
Ishan Anand UC Biomedical Engineering	9/2017- present	Capstone Advisor	BME Undergraduate University of Cincinnati
Austin Wanek UC Biomedical Engineering	1/2017- 5/2016 9/2016- 12/2016 1/2016- 5/2016 5/2016- 8/2016 9/2017- present	Primary Research Advisor Co-op Research Advisor Co-op Research Advisor Primary Research Advisor Capstone Advisor Advisor	BME Undergraduate University of Cincinnati
Rohan Srivastava UC Medical Sciences	5/2017- 8/2017	UC ROSE Program Research Advisor	Med Sci Undergraduate University of Cincinnati
Anderson Christopher OSU Biomedical Engineering	6/2016- 8/2016	Primary Research Advisor	BME Undergraduate Ohio State University
Andrew Dresmann UC Biomedical Engineering	4/2016- 5/2017	Capstone Research Advisor	MBA Graduate Student University of Cincinnati
Nathan Perry UC Biomedical Engineering	5/2016- 8/2016	Primary Research Advisor	BME Undergraduate University of Cincinnati
Sarah Li Purdue Biomedical Engineering	5/2016- 8/2016	SURF Research Advisor	BME Undergraduate Purdue University
Vincent Huang UCLA Biology	6/2015- 8/2015	UC ROSE Program Research Advisor	Medical Student. UC College of Medicine
Stacy Loushin UC Biomedical Engineering	5/2013- 8/2013 8/2014- 12/2014 8/2015- 5/2016	Primary Research Advisor Primary Research Advisor Capstone Research Advisor	Engineer Mayo Clinic
Nora Lakes UC Medical Sciences Program	10/2015- present	Medical Sciences Faculty Mentor	Medical Sciences Undergrad. University of Cincinnati
Anna Layman UC Medical Sciences Program	10/2015- present	Medical Sciences Faculty Mentor	Medical Sciences Undergrad. University of Cincinnati
Devin Ryan Washington Univ. BME	6/2015- 8/2015	Primary Research Advisor	Research Assistant WUSTL

Undergraduate Students Cont.

<i>Trainee</i>	<i>Dates</i>	<i>Role as Mentor</i>	<i>Current Position</i>
Joseph Brune UC Biomedical Engineering	8/2014- 4/2015 6/2014- 8/2014 9/2013- 12/2013	Senior Capstone Research Advisor Co-op Research Supervisor Primary Research Advisor	Research Technician Naval Medical Research Unit, Wright Patterson Air Force Base
Kyle Deans UC Biomedical Engineering	8/2014- 4/2015 1/2014- 8/2014	Senior Capstone Research Advisor Co-op Research Supervisor	
Lindsay Snider UC Biomedical Engineering	1/2015- 5/2015	NSF REU Supervisor	Quality Project Lead Janssen Inc.
Ashley Lengel UC Biomedical Engineering	1/2015- 5/2015	Co-op Supervisor	BME Undergraduate University of Cincinnati
Ceejay Boyce UC Biomedical Engineering	1/2015- 5/2015	Co-op Supervisor	Graduate Student University of Washington
Beryl Smith UC Biomedical Engineering	8/2014- 12/2014	Primary Research Advisor	Engineer, Product Management Advanced Sterilization Prods.
Kyle Stewart UC Biomedical Engineering	5/2013- 8/2013 8/2014- 5/2015	Primary Research Advisor NSF REU Supervisor	Engineer Kaleidoscope, Inc.
Daniella Patton Xavier Univ. Biophysics	5/2014- 8/2014 9/2014- 12/2014	SURF Secondary Research Advisor Secondary Research Advisor	BME Graduate Student University of Michigan
Kayla Knue UC Architectural Engineering	1/2014- 5/2014	NSF REU Supervisor	Engineering Specialist I Duke Energy
Matthew Johnson UC Biomedical Engineering	1/2014- 5/2014	NSF REU Supervisor	Assoc. Prod. Develop. Engin. Arthrex
Hannah Grossman UC Biomedical Engineering	5/2013- 8/2013	Primary Research Advisor	Master of Engineering Student Duke University
Joshua Haines UC Biomedical Engineering	5/2013- 8/2013	Primary Research Advisor	Production Engineer Cook Medical
Nicholas Corregan UC Biomedical Engineering	6/2012- 8/2012	Secondary Research Co-op Advisor	Advanced Quality Engineer Hill-Rom
Yosef Kirschner UC Biomedical Engineering	6/2012- 8/2012	Primary Research Advisor	BME Undergraduate University of Cincinnati
Tyler Fosnight UC Biomedical Engineering	6/2012- 8/2012	Secondary Research Mentor	Engineer Hill-Rom

Pre-collegiate Students

<i>Trainee</i>	<i>Dates</i>	<i>Role as Mentor</i>	<i>Current Position</i>
Shivani Ambani William Mason High School	7/2013- 8/2013	Primary Research Supervisor	Unknown
Bradley Hammor Cincinnati Country Day School	6/2011- 8/2011	Secondary Research Supervisor	BME Undergraduate Stanford University

Significant Trainee Achievements

- 2017 Karla Mercado, PhD was awarded an Early Career Trainee Travel Award by the Acoustical Society of America to Present her work at the Acoustics '17 Conference
- 2016 Karla Mercado, PhD was selected by the National Institute of Neurological Diseases and Stroke as a research fellow via their diversity supplement program
- 2016 Austin Wanek received a Robert W. Young Award for Undergraduate Student Research from the Acoustical Society of America
- 2016 Vincent Huang's poster received a first place award at the UC SURF capstone session

PROFESSIONAL MEMBERSHIPS

American Heart Association

2011 - present Member

Acoustical Society of America

2005 - 2009 Student Member
2009 - 2013 Associate Member
2013 - present Full Member

American Institute of Ultrasound in Medicine

2009 - present Member

IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society

2007 - 2009 Student Member
2009 - present Member

Sigma Xi

2003 - 2009 Associate Member
2009 - present Full Member

UNIVERSITY & PROFESSIONAL SERVICE

Professional

Acoustical Society of America

Biomedical Acoustics Technical Committee, Member, 2011 - Present

Biomedical Acoustics Student Paper Award Committee, Chair, 2010 - Present

Public Relations Committee, Member, 2015 - Present

168th Meeting of the Acoustical Society of America, Scientific Session (Cavitation Detection) Co-Chair, 2014

170th Meeting of the Acoust. Soc. of America, Scientific Session (Thrombolysis) Co-Chair, 2015

Live web streaming moderator (2015, 2016)

Resume/CV Reviewer (2016)

American Institute of Ultrasound in Medicine

Bioeffects Committee, Member, 2015-2018

AIUM 2017 Special Interest Scientific Session on Cavitation Monitoring, Session Co-Chair, 2017

Sigma Xi

UC Chapter Membership Committee, Co-Chair, 2014-present

UC Chapter Vice-President, 2016-2017

UC Chapter President, 2017-2018

Peer-Review: Journals

Ultrasound in Medicine and Biology, 2009 - Present
Advisory Editorial Board Member, 2013 - Present
Journal of the Acoustical Society of America, 2010 - Present
Journal of Ultrasound in Medicine, 2011 - Present
Medical Physics, 2012 - Present
Physics in Medicine and Biology, 2012 - Present
IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 2014 - Present
IEEE Transactions on Medical Imaging, 2016 - Present
Acta Biomaterialia, 2017
Nanoscale, 2017
Scientific Reports, 2016
Journal of Clinical Ultrasound, 2016
Journal of Thrombosis and Thrombolysis, 2016
Biomaterials, 2015
Theragnostics, 2015
Journal of Therapeutic Ultrasound, 2013

Peer-Review: Grants and Awards

University of Cincinnati, University Research Council Interdisciplinary Grants, 2017
University of Cincinnati College of Medicine Pilot Awards, 2016
Barry M. Goldwater Scholarship and Excellence in Education Program,
National Review Committee , 2014, 2015, 2017
Oak Ridge Associated Universities - Nazarbayev University grant program, 2013
North Carolina Biotechnology Centers IDG grant program, 2011, 2012

University of Cincinnati

Advisory Council for the Office of Nationally Competitive Awards, 2015-present
Goldwater Scholarship Selection Committee (Office of Nationally Competitive Awards), 2014-present
New Faculty Orientation “Research All-Stars Dos and Don’ts” Panelist, Fall 2017
Scientist Interviewer for Medical School Admissions (ROSE Program), 2017
Committee for Postdoc. Research Fellow Annual Eval. (UC-COM Office of Grad. Ed.), 2015-2017
College of Medicine Research Misconduct Investigation Panel, 2015-2016
Writing Letters of Recommendation Workshop, Panel Member, 2015, 2016
Department of Internal Medicine AAUP Merit Review Committee, 2014, 2015
UC Faculty & Staff Fundraising Campaign, Division Captain, 2014
UC Junior Faculty Biomedical Research Networking Group, Co-organizer, 2014-2015
Department of Internal Medicine Workload Document Taskforce, Chair, 2013-2014
New Faculty Orientation Work-Life Balance Panelist, Fall 2015
New Faculty Orientation Panelist, Fall 2013
Graduate School Distinguished Dissertation Completion Fellowship, Reviewer, Spring 2013
Research Culture/Marketing Committee, Member, Fall 2012
Image-guided Ultrasound Research Laboratories Journal Club, Organizer, Fall 2009 - 2016
Internal Medicine Trainee Grand Rounds, Poster Judge, 2013, 2014, 2015, 2016
Summer Capstone Symposium, Poster Judge, 2010, 2011, 2012, 2013, 2014, 2015, 2016
Graduate Student Research Forum, Poster Judge, Fall 2009, 2010, 2011, 2012, 2015, and 2016
Seminar on postdoctoral work, Panel member, Fall 2009 and Fall 2011
Coordinate External Seminar Speakers
 Timothy Hall, Ph.D., University of Michigan, April 2013
 Robert McGough, Ph.D., Michigan State University, August 2013
 Karin Przyklenk, Ph.D., Wayne State University, April 2016

CONSULTING

June 2017 - present	EKOS Corporation
June 2013 - September 2013	Ultrasound in Medicine & Biology (journal)
March 2010 - July 2013	Ultrasound in Medicine & Biology (journal)

PUBLIC RELATIONS

Coordinate professional videography session of the Image-guided Ultrasound Therapeutics Laboratories for the Joint Cardiovascular Center and American Heart Association promotional video.
Interviewed for the Joint Cardiovascular Center and American Heart Association promotional video.