Curriculum Vitae

Jason L. Raymond

Departmental Lecturer in Physical Acoustics
Dept. of Engineering Science, University of Oxford
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PROFESSIONAL EXPERIENCE

2015– University of Oxford, Department of Engineering Science,
Departmental Lecturer, 2020–(present).
Senior Research Associate, 2017–2020.
Postdoctoral Research Fellow, 2015–2017.

2013–2014 Visiting Research Fellow, Thoraxcenter–Erasmus Medical Center, Rotterdam, the Netherlands.

2009–2015 Research Engineer (Doctoral RA), Dept. of Internal Medicine, University of Cincinnati.

2004–2009 R&D Engineer, National Center for Physical Acoustics, University of Mississippi.

2002–2003 Principal Engineer, Sanus Medical Acoustics, Inc., Oxford, Mississippi.

1999–2002 Research Assistant, Radiology, Brigham & Women's Hospital, Harvard Medical School.

Academic Posts and Affiliations

2021– Junior Research Fellow, Kellogg College, Oxford.

2019–2020 Senior Researcher, Imaging w/sound+light, Rosalind Franklin Institute, Harwell, Oxfordshire.

2018–2021 Co-Investigator, Oxford-Suzhou Centre for Advanced Research, Suzhou, China.

2016–2021 Research Member of Common Room, Kellogg College, Oxford.

EDUCATION

2015 Ph.D. Biomedical Engineering, University of Cincinnati.

2002 M.S. Mechanical Engineering, Boston University.

1999 B.S. Engineering Acoustics, Boston University.

Postgraduate Training

2017 Son et Lumière, *Light and sound at the nanoscale*. École de Physique des Houches, France.

2015–2016 Frederick V. Hunt Postdoctoral Research Fellowship in Acoustics.

2014 12th School on Acousto-Optics and Applications, Druskininkai, Lithuania.

2013–2014 Whitaker Fellowship in Biomedical Engineering, Erasmus Medical Center, Rotterdam.

2013 Postbaccalaureate certificate. Preparing Future Faculty Program, Univ. of Cincinnati.

2006 Physical Acoustics Summer School, Sunrise Springs, New Mexico.

2005 Mayneord-Phillips Summer School, *Ultrasound and other minimally invasive therapies*.
St. Edmund Hall, University of Oxford.

HONORS AND AWARDS

2021 Junior Research Fellowship, Kellogg College, Oxford.

2019 Elected to Physical Acoustics Committee, Institute of Physics (UK).

2017 Article selected for *Physics in Medicine & Biology—Highlights of 2016*.

2016 Best poster award and prize, SPIE Biophotonics Conf., Univ. of St. Andrews.

2015 Best dissertation in Biomedical Engineering, University of Cincinnati.

2014 38th F.V. Hunt Postdoctoral Research Fellowship of the Acoustical Society of America.

2012 Whitaker International Fellowship, Institute for International Education.
2011 Sigma Xi Grant-in-aid of Research award, University of Cincinnati.
2011 Elected to Student Council of the Acoustical Society of America.
2006 Discussion Leader Scholarship, Physical Acoustics Summer School.
2005 Best presentation award, Mayneord-Phillips Summer School.
1999 Nominee for Boston University Alumni Downtown Club Student Service Award.

PROFESSIONAL APPOINTMENTS AND ACTIVITIES

University of Oxford,
Member of Congregation, 2017–(present).

Department of Engineering Science, University of Oxford,
Faculty of Engineering Science, 2020–(present).
Equality, Diversity, and Inclusion Committee, 2021–(present).
Chair of Researcher Corcordat & Professional Development subgroup, 2022–(present).
Begbroke Engineering Science Steering Committee, 2020–(present).
Biomedical Engineering Panel, 2020–(present).
Researcher Committee, 2018–2020.

Kellogg College (constituent college of the University of Oxford),
Junior Research Fellow, 2021–(present).
College Advisor, Health Care & Medical Sciences, 2020–(present).
College Advisor, Science and Engineering, 2017–(present).
Research Member of Common Room, 2016–2021.

Oxford-Suzhou Centre for Advanced Research, Suzhou, China,
Co-Investigator, 2018–2021.

Acoustical Society of America, Member,
Physical Acoustics Technical Committee, 2016–(term to 2022).
Biomedical Acoustics Technical Committee, 2015–(term to 2024).
Education in Acoustics Committee, 2021–(term to 2024).
Frederick V. Hunt Postdoctoral Research Fellow, 2015–16.
Student Council (elected to represent Biomedical Acoustics), 2011–2014,
Chair, Orientation subcommittee, 2013.
Regional Chapters subcommittee, 2012–2014.
University of Cincinnati Student Chapter,
Chair (founding member), 2011–2012.
Chapter Representative to National, 2012–2015.

Institute of Physics, Member,
Physical Acoustics Committee, 2019–(term to 2023).

International Society of Therapeutic Ultrasound, Member,
Tutorial lecturer, 17th ISTU, Nanjing, China. 2017.

Other professional society memberships:
IEEE-UFFC, Ultrasonics, Ferroelectrics, and Frequency Control Society, Associate Member.
European Focused Ultrasound Society, Member.
International Photoacoustic Standardization Consortium, Member.
EPSRC UK Acoustics Network, Member.
EPSRC Therapy Ultrasound Network for Drug Delivery and Ablation Research, Member.
EPSRC Image-Guided Therapies Network+, Member.
Sigma Xi (former member).

PROFESSIONAL SERVICE

Event organization

2022 Symposium co-Chair, 22nd International Symposium on Nonlinear Acoustics, Oxford, UK.
2021 Tutorial Day co-organizer, *Machine Learning in Physical Acoustics*, Institute of Physics (UK).

Chaired and co-chaired sessions at international conferences

2022 co-Chair, *Interaction of Light and Sound*, 183rd ASA, Nashville, USA.
2022 Chair, *Cavitation*, 22nd ISNA, Oxford, UK.
2019 Chair, *Novel Ultrasound Imaging*, 23rd ICA, Aachen, Germany.
2017 Co-chair, *Therapeutic Ultrasound Modeling & Physics*, 17th ISTU, Nanjing, China.

Tutorials at international conferences

2017 Tutorial lecturer, "Cavitation for Clinicians," 17th ISTU, Nanjing, China.

Editorial service

2022 Guest editor, special issue on biomedical imaging using light+sound, *Sensors.*
2012–2013 Editorial assistant, *Ultrasound in Medicine & Biology* (C.K. Holland, Editor-in-chief).

Peer-review service *(date first invited)*

2022 *Journal of Applied Physics, Ultrasonics Sonochemistry.*
2021 *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control. Journal of Ultrasound in Medicine. Advanced Engineering Materials.*
2020 *Theranostics, Microvascular Research, Measurement.*
2019 *Biomedical Optics Express.*
2018 *Physics in Medicine and Biology, Ultrasonics.*
2017 *Frontiers of Optoelectronics.*
2015 *International Journal of Hyperthermia, PLoS One.*
2013 *Colloids and Surfaces B: Biointerfaces.*
2012 *Ultrasound in Medicine & Biology.*
2006 *Journal of the Acoustical Society of America.*

Advisory Boards

2017–2021 Management Committee, Oxford-Suzhou Centre for Advanced Research.
2012 Graduate student representative to external advisory board, University of Cincinnati School of Energy, Environmental, Biological and Medical Engineering.
2005–2008 Director's advisory council, National Center for Physical Acoustics (H.E. Bass, Director).

Consultancies

2020	Subject Matter Expert	NASA L'SPACE Program
2018	Operations consulting	Oxford University (Suzhou) Science & Technology Co., Ltd.
2009–2010	Technical consulting	University of Mississippi Dept. of Physics and Astronomy
2005	Technical consulting	CVRx, Inc.

2001–2010	Database SQL programming	Appraisal Systems, Inc.
2001	Technical consulting	McGinty Consulting Group, Boston

INVITED SEMINARS

2019 JITRI-UK Science & Technology Innovation Week, Suzhou, China. 11 Dec. Oral Presentation.
2019 JITRI-UK Partners Cooperation Symposium, Oxford, UK. 28 June. Oral Presentation.
2018 Soochow University College of Chemistry, Suzhou, China. 30 March. Seminar.
2018 Tsinghua University School of Environment, Beijing. 27 March. Seminar.
2017 National Physical Laboratory, Teddington, UK. 21 November. Seminar.
2017 17th Int'l Symposium on Therapeutic Ultrasound, Nanjing. May. Pre-meeting tutorial lecture.
2015 Southeast University, Key Laboratory for Biomaterials and Devices. 12 October. Seminar.
2015 Nanjing University, Institute of Acoustics. 30 September. Seminar.
2015 University of Mississippi, Dept. of Physics and Astronomy. 14 April. Colloquium.
2014 Whitaker International Program Seminar, Rome, Italy. 28 March. Oral Presentation.
2013 Technical University of Denmark, Center for Fast Ultrasound Imaging. 5 August. Seminar.
2012 Research Grand Rounds, Dept. of Internal Medicine, University of Cincinnati. May.
2011 Award Presentation: Grant-in-aid of Research, University of Cincinnati Sigma Xi Chapter. Nov.
2011 Research Grand Rounds, Dept. of Internal Medicine, University of Cincinnati. May.
2007 Impulse Devices, Inc. Grass Valley, California. October. Oral Presentation.
2005 University of Pittsburgh Medical Center, Dept. of Critical Care Medicine. October. Seminar.
2005 Teratech Corporation, Burlington, Massachusetts. April. Seminar.
2004 Tripler Army Medical Center, Dept. of Clinical Investigation, Honolulu, Hawaii. June. Seminar.
2002 National Center for Physical Acoustics, University of Mississippi. February. Seminar.
2000 Boston University, Dept. of Biomedical Engineering. November. Guest lecture.

PUBLICATIONS

Summary of Scholarly Communications

21 articles appearing in refereed journals, 9 articles in edited conference proceedings. 3 patents filed. 56 presentations (9 invited) at national and international meetings. 20 invited seminars, colloquia or lectures. 700+ citations reported by Google Scholar; h-index = 14.

Peer-reviewed Articles

25. * Ng CK, **Raymond JL**, Driscoll C, Oldroyd S, Huang WE, Thompson IP, Roy RA. Use of static overpressure to assess the role of acoustic cavitation in ultrasound-mediated gene transfection. *In preparation*.
24. * **Raymond JL**, Marques M, Everbach EC, Hughes M, Roy RA, Podoleanu A. Detection of HIFU Lesions by Optical Coherence Tomography. *In preparation*.
23. * Wang AA, Persa D, Helin S, Smith KP, Raymond JL, Monroe CW. Compressibility of Lithium Hexafluorophosphate Solutions in Two Carbonates. *Submitted to Journal of The Electrochemical Society. October 2022.*

22. * Gill H, Fernandes JF, Nio A, Dockerill C, Alastruey-Arimon J, Shah N, Ahmed N, **Raymond JL**, Wang S, Sotelo J, Urbina J, Uribe S, Rajani R, Rhode K, Lamata P. Aortic stenosis: haemodynamic benchmark and metric reliability study. *Submitted to Journal of Cardiovascular Translational Research*.
21. Ng CK, Putra SL, Kennerley J, Habgood R, Roy RA, **Raymond JL**, Thompson IP, Huang WE. Genetic engineering biofilms *in situ* using ultrasound-mediated DNA delivery. *Microbial Biotechnology* (2021). doi:10.1111/1751-7915.13823
20. Yang Y, Yang D, Zhang Q, Guo X, **Raymond JL**, Roy RA, Zhang D, Tu J. The influence of droplet concentration on phase change and inertial cavitation thresholds associated with acoustic droplet vaporization. *Journal of the Acoustical Society of America* 148, EL375 (2020). doi:10.1121/10.000227
19. Nio AQX, Faraci A, Christensen-Jeffries K, **Raymond JL**, Monaghan MJ, Fuster D, Forsberg F, Eckersley RJ, Lamata P. Optimal control of SonoVue microbubbles to estimate hydrostatic pressure. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* 67:557–567 (2020). doi:10.1109/TUFFC.2019.2948759
18. Yang Y, Tu J, Yang D, **Raymond JL**, Roy RA, Zhang D. Photo- and Sono-dynamic therapy: A review of mechanisms and considerations for pharmacological agents used in therapy incorporating light and sound. *Current Pharmaceutical Design* 25:1 (2019). doi:10.2174/1381612825666190123114107
17. **Raymond JL**, Cleveland RO, Roy RA. HIFU-induced changes in optical scattering and absorption of tissue over nine orders of thermal dose. *Physics in Medicine and Biology* 63(24), 245001 (2018). doi:10.1088/1361-6560/aaed69
16. Shekhar H, Smith NJ, **Raymond JL**, Holland CK. Effect of temperature on the size distribution, shell properties, and stability of Definity®. *Ultrasound in Medicine & Biology*, 44(2), 434–46 (2018). doi:10.1016/j.ultrasmedbio.2017.09.021
15. Luan Y, Renaud G, **Raymond JL**, Segers T, Lajoinie G, Beurskens R, Mastik F, Kokhuis T, van der Steen AFW, Versluis M, de Jong N. Combined optical sizing and acoustical characterization of single freely-floating microbubbles. *Applied Physics Letters* 109, 234104 (2016). doi:10.1063/1.4971391
14. **Raymond JL**, Luan Y, Peng Y, Huang S-L, McPherson DD, Versluis M, de Jong N, Holland CK. Loss of gas from echogenic liposomes exposed to pulsed ultrasound. *Physics in Medicine and Biology* 61(23), 8321–39 (2016). doi:10.1088/0031-9155/61/23/8321 *– Article selected for Highlights of 2016*.
13. Bader KB, Crowe MJ, **Raymond JL**, Holland CK. The effect of frequency-dependent attenuation on predicted histotripsy waveforms in tissue mimicking phantoms. *Ultrasound in Medicine & Biology* 42(7), 1701–5 (2016). doi:10.1016/j.ultrasmedbio.2016.02.010
12. Haworth KJ, **Raymond JL**, Radhakrishnan K, Moody MR, Huang S-L, Peng T, Shekhar H, Klegerman ME, Kim H, McPherson DD, Holland CK. Trans-stent b-mode ultrasound and passive cavitation imaging. *Ultrasound in Medicine & Biology* 42(2), 518–27 (2016). Erratum 42(5), 1244. doi:10.1016/j.ultrasmedbio.2015.08.014
11. **Raymond JL**, Luan Y, van Rooij T, Kooiman K, Huang SL, McPherson DD, Versluis M, de Jong N, Holland CK. Impulse response method for characterization of echogenic liposomes. *Journal of the Acoustical Society of America* 137, 1693–1703 (2015). doi:10.1121/1.4916277
10. Sutton JT, **Raymond JL**, Verleye MC, Pyne-Geithman GJ, Holland CK. Pulsed ultrasound enhances the delivery of nitric oxide from bubble liposomes to *ex vivo* porcine carotid tissue. *International Journal of Nanomedicine* 9, 4671–83 (2014). doi:10.2147/IJN.S63850
9. **Raymond JL**, Haworth KJ, Bader KB, Radhakrishnan K, Griffin JK, Huang SL, McPherson DD, Holland CK. Broadband attenuation measurements of phospholipid–shelled ultrasound contrast agents. *Ultrasound in Medicine & Biology* 40, 410–21 (2014). doi:10.1016/j.ultrasmedbio.2013.09.018

8. Radhakrishnan K, Bader KB, Haworth KJ, Kopechek JA, **Raymond JL**, Huang S-L, McPherson DD, Holland CK. Relationship between cavitation and loss of echogenicity from ultrasound contrast agents. *Physics in Medicine and Biology* 58, 6541–63 (2013). doi:10.1088/0031-9155/58/18/6541
7. Bouchoux G, Bader KB, Korfhagen JJ, **Raymond JL**, Shivashankar R, Abruzzo TA, Holland CK. Experimental validation of a finite-difference model for the prediction of transcranial ultrasound fields based on CT images. *Physics in Medicine and Biology* 57, 8005–22 (2012). doi:10.1088/0031-9155/57/23/8005
6. Kandadai MA, **Raymond JL**, Shaw GJ. Comparison of electrical conductivities of various brain phantom gels: Developing a 'brain gel model'. *Materials Science and Engineering C* 32, 2664–7 (2012). doi:10.1016/j.msec.2012.07.024
5. Bader KB, **Raymond JL**, Mobley J, Church CC, Gaitan DF. The effect of static pressure on the inertial cavitation threshold. *Journal of the Acoustical Society of America* 132, 728–37 (2012). doi:10.1121/1.4733539
4. Kopechek JA, Haworth KJ, **Raymond JL**, Mast TD, Perrin SR, Klegerman ME, Huang S, Porter TM, McPherson DD, Holland CK. Acoustic characterization of echogenic liposomes: Frequency-dependent attenuation and backscatter. *Journal of the Acoustical Society of America* 130, 3472–81 (2011). doi:10.1121/1.3626124
3. Lonzaga JB, **Raymond JL**, Mobley J, Gaitan DF. Suppression of an acoustic mode by an elastic mode of a liquid-filled spherical shell resonator. *Journal of the Acoustical Society of America* 129, 597–603 (2011). doi:10.1121/1.3523337
2. Gaitan DF, Tessien RA, Hiller RA, Gutierrez J, Scott C, Tardif H, Callahan B, Matula TJ, Crum LA, Holt RG, Church CC, **Raymond JL**. Transient cavitation in high-quality-factor resonators at high static pressures. *Journal of the Acoustical Society of America* 127, 3456–65 (2010). doi:10.1121/1.3377062
1. Miller MW, Church CC, Labuda C, Mazza S, **Raymond J**. Biological and environmental factors affecting ultrasound-induced hemolysis in vitro: 5. Temperature. *Ultrasound in Medicine & Biology* 32, 893–904 (2006). doi:10.1016/j.ultrasmedbio.2006.02.1423

Articles Published in Conference and Symposium Proceedings

9. Gupta I, Nio AQX, Faraci A, Torkzaban M, Christensen-Jeffries K, Nam K, **Raymond JL**, Wallace K, Monaghan MJ, Fuster D, Eckersley RJ, Lamata P, Forsberg F. The Effects of Hydrostatic Pressure on the Subharmonic Response of SonoVue and Sonazoid. *Proceedings - IEEE International Ultrasonics Symposium* 2019. doi:10.1109/ULTSYM.2019.8925812
8. **Raymond JL**, Cleveland RO, Roy RA. Changes in the optical scattering and absorption spectra of ex-vivo chicken breast tissue following exposure to HIFU. *Proceedings - 17th International Symposium on Therapeutic Ultrasound* 2017, *J. Therapeutic Ultrasound* 6(Suppl 1):2, 40. doi:10.1186/s40349-018-0110-x
7. Nio AQX, Faraci A, Christensen-Jeffries K, Eckersley RJ, Monaghan MJ, **Raymond JL**, Forsberg F, Lamata P. The subharmonic amplitude of SonoVue increases from 0–75 mmHg hydrostatic pressure at low incident acoustic pressures. *Proceedings - IEEE International Ultrasonics Symposium* 2017;P1-C3-7. doi:10.1109/ULTSYM.2017.8092984
6. Luan Y, Renaud G, **Raymond JL**, Beurskens R, Mastik F, Kokhuis TJA, van der Steen AFW, de Jong N, Segers T, Lajoinie GPR, Versluis M. Nonlinear dynamics of single freely-floating microbubbles under prolonged insonation. *Proceedings - IEEE International Ultrasonics Symposium* 2014;1786–1789. doi:10.1109/ULTSYM.2014.0443
5. Bader KB, **Raymond JL**, Mobley J, Church CC, Gaitan DF. Inertial cavitation threshold dependence on static pressures. *Proceedings of Meetings on Acoustics* 2010;9:045002–14. doi:10.1121/1.3486533

4. Durning B, **Raymond J**, Church CC, Cleveland RO, Miller EL. HIFU lesion characterization on liver: Acquisition and results. *AIP Conference Proceedings - 8th International Symposium on Therapeutic Ultrasound* 2009;1113:96–100. doi:10.1063/1.3131479
3. Davis S, **Raymond, J**, and Church C. Acute effects of high intensity focused ultrasound on blood vessels in vivo. *AIP Conference Proceedings - 5th International Symposium on Therapeutic Ultrasound* 2006;829:54–58. doi:10.1063/1.2205437
2. Labuda C, **Raymond JL**, Church CC. Reciprocity calibration of hydrophones in the megahertz frequency range. *Proceedings - IEEE International Ultrasonics Symposium* 2004;3:1595–7. doi:10.1109/ULTSYM.2004.1418125
1. **Raymond, JL**, King RL, and Hynynen K. Evaluation of the combined concentric-ring sector-vortex phased array for MR-guided ultrasound surgery. *Proceedings - IEEE International Ultrasonics Symposium* 2000;1457–1460. doi:10.1109/ULTSYM.2000.921598

Technical Reports

9. Final Report: Hester Cordelia Parsons Fund, submitted to University of Oxford Mathematical, Physical and Life Sciences Division, June 2018. Author. *In preparation*.
8. Final Report of the 38th F.V. Hunt Postdoctoral Research Fellowship in Acoustics, submitted to the Executive Director of the Acoustical Society of America, September 2016. Author.
7. Final Report of the 2012 Whitaker International Fellowship in Biomedical Engineering, submitted to Whitaker International Fellows and Scholars Program, July 2014. Author.
6. Final Report: "Advanced Cavitation Power Technology," submitted to Impulse Devices, Inc., Grass Valley, Califiornia, 17 August 2009; 555 pages. Contributor. Quarterly Reports: 25 April 2008, 64 pages; 21 July 2008, 23 pages; 21 October 2008, 67 pages; 22 January 2009, 117 pages; 18 May 2009, 169 pages; 23 July 2009, 85 pages.
5. Final Report: "Remote Acoustic Hemostasis and Other Applications of Image-Guided High Intensity Focused Ultrasound (HIFU) Therapy," submitted to U.S. Army Medical Research and Materiel Command, Fort Detrick, Maryland, 31 October 2007; 89 pages + appendix. Contributor. Quarterly Reports: 31 January 2007; 36 pages; 30 April 2007, 24 pages; 31 July 2007, 27 pages.
4. Annual Report: "Remote Acoustic Hemostasis and Other Applications of Image-Guided High Intensity Focused Ultrasound (HIFU) Therapy," submitted to U.S. Army Medical Research and Materiel Command, Fort Detrick, Maryland, December 14, 2006; 124 pages + Appendix. Contributor. Quarterly Reports: 31 January 2006; >200 presentation slides; 30 April 2006, 55 pages; 31 July 2006, 35 pages; 31 October 2006, 35 pages.
3. Annual Report: "Remote Acoustic Hemostasis and Other Applications of Image-Guided High Intensity Focused Ultrasound (HIFU) Therapy," submitted to U.S. Army Medical Research and Materiel Command, Fort Detrick, Maryland, 16 December 2005; 242 pages + Appendix. Contributor. Quarterly Reports: 31 January 2005, >200 presentation slides; 30 April 2005, 182 pages; 31 July 2005, >200 presentation slides; 31 October 2005, 55 pages.
2. Annual Report: "Remote Acoustic Hemostasis and Other Applications of Image-Guided High Intensity Focused Ultrasound (HIFU) Therapy," submitted to U.S. Army Medical Research and Materiel Command, Fort Detrick, Maryland, 16 December 2004; 214 pages + Appendix. Contributor. Quarterly Reports: 30 April 2004, 40 pages; 31 July 2004, >200 presentation slides; 31 October 2004, 154 pages.
1. Final Report: "Development of Ultrasound Technology for Remote Acoustics Hemostasis Applications," submitted to The University of Mississippi, National Center for Physical Acoustics, 15 November 2003. Principal author. Interim Report; 16 April 2003; 8 pages.

Thesis

J.L. Raymond, Bioactive gas encapsulation and release from echogenic liposomes. Ph.D. Dissertation, University of Cincinnati, 2015. Major Professor: C.K. Holland.

J.L. Raymond, Phased-array ultrasound applicators for extracorporeal thermal ablation of localized tumors. M.S. Thesis, Boston University, 2002. Research Advisor: K. Hynynen, Harvard Medical School. Major Professor: R.A. Roy.

Other Contributions

Contributor to *Appendix C.4 – Program for Discrete Fourier Analysis* in W.R. Bennett, *The Science of Musical Sound: Volume 1: Stringed Instruments, Pipe Organs, and the Human Voice*. Springer International Publishing, 2018. doi:10.1007/978-3-319-92796-1

PATENTS

W.E. Huang, R.A. Roy, I.P. Thompson, C.K. Ng, J.L. Raymond. Biofilm Transformation. Patent application GB1913045.9, filed 10 September 2019. US 17/641,586.

B. Choubey, R.A. Roy, C. Chen, J.L. Raymond. Dual-mode ultrasound system. U.K. Application No. 1800536.3 filed 12 January 2018.

C. K. Holland, J.L. Raymond, J.T. Sutton. Bioactive gas-encapsulated echogenic liposomes and methods for treating cardiovascular disease. U.S. Patent No. 10,500,227 issued 10 December 2019.

PRESENTATION ABSTRACTS

57. * Grasso V, **Raymond J**, Regine Willumeit-Roemer, Joseph J, Jose J. Development and characterization of a durable tissue-mimicking phantom for calibration and standardization of photoacoustic imaging. SPIE Photonics West, Photons Plus Ultrasound: Imaging and Sensing 2023
56. * **Raymond JL**, Marques M, Everbach EC, Hughes M, Roy RA, Podoleanu A. Detection of HIFU lesions by optical coherence tomography. J.Acoust.Soc.Am. 145:1811. To be presented at the 183rd Meeting of the Acoustical Society of America; Nashville. December 2022. *Invited.*
55. **Raymond JL**, Marques M, Everbach EC, Hughes M, Roy RA, Podoleanu A. Detection of HIFU lesions by optical coherence tomography. J.Acoust.Soc.Am. 145:1811. Presented at IoP Optics + Ultrasound V, London. September 2022.
54. **Raymond JL**, Kwan JJ, Stride E, Roy RA. Nonlinear dilatational viscosity and shear-thinning in lipid-encapsulated microbubbles. 22nd International Symposium on Nonlinear Acoustics, Oxford, UK. July 2022.
53. Usadi LN, Kwan JJ, **Raymond JL**, Roy RA. Inertial and stable cavitation noise characterization in a sonochemical reactor using SVD and machine-learning techniques. 22nd International Symposium on Nonlinear Acoustics, Oxford, UK. July 2022.
52. Wong CY, **Raymond JL**, Kwan JJ. Design and characterization of a novel sonochemical reactor design. 22nd International Symposium on Nonlinear Acoustics, Oxford, UK. July 2022.
51. Ng CK, **Raymond JL**, Driscoll C, Oldroyd S, Huang WE, Thompson IP, Roy RA. Use of static overpressure to assess the role of acoustic cavitation in ultrasound-mediated gene transfection. J.Acoust.Soc.Am. 151:A173. May 2022.

50. **Raymond JL**, Roy RA, Kwan J. A multi-frequency sonochemical reactor utilizing a cylindrically-focused acoustic wavefield for improved sonochemical efficiency. J.Acoust.Soc.Am. 151:A61. May 2022.
49. Joseph J, **Raymond JL**. Rapid three-dimensional mapping of HIFU-induced hyperthermia. The 52nd Annual Scientific Meeting of the British Medical Ultrasound Society. November 2021.
48. **Raymond JL**, Everbach EC, Roy RA, Marques M, Hughes M, Podoleanu A. HIFU tissue lesion quantification by optical coherence tomography. J.Acoust.Soc.Am. 145:1811. May 2019.
47. Shrivastava S, Everbach EC, **Raymond JL**, Roy RA. Irreversible shifts in optical autofluorescence spectra applied to the assessment of thermal lesion formation under high intensity focused ultrasound. J.Acoust.Soc.Am. 145:1778. May 2019. *Invited*.
46. **Raymond JL**, Marques M, Everbach EC, Hughes M, Roy RA, Podoleanu A. Optical system for avoidance of high intensity focused ultrasound skin burns. EPSRC Image-guided Therapy Network; St. Thomas' Hospital, London. March 2019. *Invited*.
45. **Raymond JL**, Cleveland RO, Roy RA. Threshold for changes in optical properties of tissue due to HIFU-induced thermal ablation. ThUNDDAR Workshop; University of Leeds, England. July 2018. *Invited.*
44. Nio AQX, Faraci A, Christensen-Jeffries K, **Raymond JL**, Monaghan MJ, Fuster D, Forsberg F, Eckersley RJ, Lamata P. Direct response of the subharmonic signal of SonoVue across physiologically-relevant diastolic pressures. AIUM 2018 Annual Convention, New York, March 2018.
43. **Raymond JL.** Physical Acoustics and Oxford: My experience as a researcher, a fellow, and beyond. J.Acoust.Soc.Am. 142:2635. Presented at the 174th Meeting of the Acoustical Society of America; New Orleans. December 2017. *Invited.*
42. **Raymond JL**, Cleveland RO, Roy RA. Changes in the optical scattering and absorption spectra of ex-vivo chicken breast tissue following exposure to high intensity focused ultrasound. Presented at IoP Optics + Ultrasound IV; University of Strathclyde. November 2017.
41. **Raymond JL**, Melia J, Roy RA, Cleveland RO. Monitoring HIFU heating in a tissue phantom using temperature-sensitive crystals. Presented at the Dosimetry and Exposimetry Workshop; National Physical Laboratory, Teddington, UK. September 2017.
40. Cleveland RO, Adams MT, **Raymond JL**, Roy RA. 'Seeing' HIFU Lesions with Ultrasound. Proceedings of 39th IEEE Engineering in Medicine and Biology Society. S. Korea. July 2017. *Invited*.
39. **Raymond JL**, Cleveland RO, Roy RA. Changes in the optical scattering and absorption spectra of ex-vivo chicken breast tissue following exposure to high intensity focused ultrasound. J.Acoust.Soc.Am. 141:4015. Presented at the 173rd Meeting of the Acoustical Society of America and the 8th Forum Acusticum. Boston. June 2017.
38. Shekhar H, Smith N, **Raymond JL**, Holland CK. Impact of temperature on the size distribution and shell properties of ultrasound contrast agents. J.Acoust.Soc.Am. 141:3952. 2017.
37. **Raymond JL**, Cleveland RO, Roy RA. Changes in the optical scattering and absorption spectra of ex-vivo chicken breast tissue following exposure to HIFU. Presented at the 17th International Symposium on Therapeutic Ultrasound; Nanjing, China. June 2017.
36. **Raymond JL** and Roy RA. Cavitation for Clinicians. Presented at the 17th International Symposium on Therapeutic Ultrasound; Nanjing, China. June 2017. *Invited*.
35. **Raymond JL**, Edwards E, Cleveland RO, Roy RA. FLIR thermography and optical spectroscopy for assessment of changes in ex vivo tissues exposed to high intensity focused ultrasound. Presented at the 15th Meeting of the UK Therapy Ultrasound Group; York, UK. December 2016.

34. **Raymond JL**, Edwards E, Cleveland RO, Roy RA. Optical property changes in ex vivo tissues exposed to high intensity focused ultrasound. Presented at SPIE Biophotonics North; University of St. Andrews, Scotland. November 2016. *Awarded 'Best Poster Presentation' by Academic Committee.*
33. **Raymond JL**, Edwards E, Cleveland RO, Roy RA. Optical property changes in ex vivo tissues exposed to high intensity focused ultrasound. J.Acoust.Soc.Am. 139:2029. Presented at the 171st Meeting of the Acoustical Society of America; Salt Lake City. May 2016.
32. **Raymond JL**, Luan Y, Peng T, McPherson DD, Versluis M, de Jong N, Holland CK. Loss of gas from echogenic liposomes exposed to pulsed ultrasound. Presented at the 5th Microbubble Symposium; University of Leeds. June 2015.
31. **Raymond JL**, Holland CK. Echogenic liposomes for therapeutic bioactive gas delivery. Presented at the 12th Meeting of the UK Therapy Ultrasound Group; National Physical Laboratory, Teddington, UK. May 2015.
30. Crowe MJ, **Raymond JL**, Holland CK, Bader K. Broadband attenuation measurements of tissue-mimicking phantoms employed for histotripsy. J.Acoust.Soc.Am. 137:2399. 2015.
29. **Raymond JL**, Luan Y, van Rooij T, Huang SL, McPherson DD, de Jong N, Holland CK. Estimation of damping coefficient based on the impulse response of echogenic liposomes. J.Acoust.Soc.Am. 135:2310. Presented at the 167th Meeting of the Acoustical Society of America; Providence, RI. May 2014.
28. Luan Y, Renaud G, **Raymond JL**, Segers T, Beurskens R, Kokhuis TJA, van der Steen AFW, Versluis M, de Jong N. The stable nonlinear acoustic response of free-floating lipid-coated microbubbles. J.Acoust.Soc.Am. 135:2310. 2014.
27. **Raymond JL**, Luan Y, van Rooij T, Huang SL, McPherson DD, de Jong N, Holland CK. Impulse response of echogenic liposomes. Presented at the 19th European Symposium on Ultrasound Contrast Imaging; Rotterdam, the Netherlands. January 2014.
26. Luan Y, Renaud G, Kokhuis T, **Raymond JL**, van der Steen AFW, de Jong N. Stable non-linear dynamics of free-floating lipid-coated microbubbles. 19th European Symposium on Ultrasound Contrast Imaging. 2014.
25. Sutton JT, **Raymond JL**, Verleye MC, Pyne-Geithman GJ, Rubinstein J, Holland CK. Ultrasound-mediated delivery of bioactive nanobubbles to vascular tissue. J.Acoust.Soc.Am. 134:4048. 2013. *Invited.*
24. Bader KB, Radhakrishnan K, Haworth KJ, **Raymond JL**, Huang SL, Peng T, McPherson DD, Holland CK. Modeling the loss of echogenicity from ultrasound contrast agents. J.Acoust.Soc.Am. 134:3977. 2013.
23. Sutton JT, Radhakrishnan K, **Raymond JL**, Bader KB, Bouchoux G, Haworth KJ, Pyne-Geithman GJ, Holland CK. Ultrasound-mediated drug delivery for the treatment of cardiovascular disease. 55Th American Association of Physicists in Medicine Annual Meeting. August 2013.
22. **Raymond JL**, Haworth KJ, Bader KB, Radhakrishnan K, Huang S-L, McPherson DD, Holland CK. Broadband attenuation and size measurements of ultrasound contrast agents. Ultrasound in Medicine and Biology 39:S92–S93. Presented at 14th World Congress of Ultrasound in Medicine and Biology - WFUMB 2013; Sao Paulo, Brazil. May 2013.
21. **Raymond JL**, Haan C, Holland CK. The challenge of orchestrating for the organ and the orchestra. J.Acoust.Soc.Am. 132:1901. Presented at 164th Meeting of the Acoustical Society of America; Kansas City. October 2012.
20. Korfhagen JJ, **Raymond JL**, Holland CK, Shaw GJ. Effect of skull anatomy on intracranial acoustic fields for ultrasound-enhanced thrombolysis. J.Acoust.Soc.Am. 132:2065. 2012.

19. Bouchoux G, Bader KB, Korfhagen JJ, **Raymond JL**, Ravishankar S, Abruzzo TA, Holland CK. Validation of a finite-difference acoustic propagation model of transcranial ultrasound. J.Acoust.Soc.Am. 132:1927. 2012. *Invited.*
18. Bader KB, **Raymond JL**, Mobley J, Church CC, Gaitan DF. The effect of static pressure on the inertial cavitation threshold and collapse strength. J.Acoust.Soc.Am. 129:2587. 2011.
17. **Raymond JL**, Chrzanowski SM, Holland CK, Shaw GJ. Use of the angular spectrum approach for estimating the 3-D acoustic field transmitted through skull. Proceedings of the 2010 Annual Meeting of the Biomedical Engineering Society 2010:54. Presented at the Annual Meeting of the Biomedical Engineering Society; Austin, TX. October 2010.
16. Bader KB, **Raymond JL**, Mobley J, Church CC, Gaitan DF. Inertial cavitation threshold dependence on high static pressures. J.Acoust.Soc.Am. 128:2313. 2010.
15. Mobley J, **Raymond JL**, Prather WE, Gaitan DF. Internal mapping of the normal modes of a liquid filled spherical resonator. J.Acoust.Soc.Am. 128:2313. 2010.
14. Bader KB, **Raymond JL,** Mobley J, Gaitan DF. Inertial cavitation threshold dependence on high static pressures. J.Acoust.Soc.Am. 127:1984. 2010.
13. Bader K, **Raymond JL,** Mobley J, Gaitan DF, Tessien RA, Hiller RA. Characterization of high-Q spherical resonator. Bulletin of the American Physical Society 52(13):SES07. 2007.
12. **Raymond JL,** Bader K, Mobley J, Gaitan DF, Hiller RA, Tessien, RA. Characterization of a large volume spherical resonator for studies of acoustically induced cavitation in liquids. J.Acoust.Soc.Am. 122:2991. Presented at 154th Meeting of the Acoustical Society of America; New Orleans. November, 2007.
11. Woolworth D, **Raymond JL**, Mobley J. Characterization of low-profile fresnel lenses for annular high-intensity focused ultrasound radiators. J.Acoust.Soc.Am. 122:3008. 2007.
10. Mobley J, **Raymond JL**, Woolworth D, Davis S, Church C, Kaczkowski P. Development of variable-depth HIFU applicators for remote acoustic hemostasis under ultrasound image guidance. 32nd International Symposium on Ultrasonic Imaging and Tissue Characterization; Arlington, VA, May 2007.
9. Mididoddi P, Upadhye S, **Raymond J**, Church C, Davis S, Repka M. Influence of etching and ultrasound on the permeability of Ciclopirox through the human nail. AAPS J 8:R6114. American Association of Pharmaceutical Scientists Annual Meeting and Exposition; San Antiono. October 2006.
8. Mobley J, **Raymond JL**, Vuppala S, Hoing D, Woolworth D, Labuda C, Church C, Davis S. Progress towards development of a portable image-guided remote acoustic hemostasis device. Presented at Memphis Bioimaging Symposium; Memphis. October 2006.
7. Davis S, **Raymond JL**, Church CC, Mobley J, Bass H, Kaczkowski P, Cunitz B, Wang Y, Starr F, Crum LA, Puyana JC, Sung C, and Morrison C. High-intensity focused ultrasound for hemorrhage control for hemostasis. Presented at Advanced Technology Applications for Combat Casualty Care Conference (ATACCC); St. Petersburg. August 2006.
6. Morrison CA, Probst R, Collins G, Hashiro G, Ichimura W, Uyehara C, Davis S, **Raymond, J**. High intensity focused ultrasound treatment of a simulated missile tract injury in a rabbit model. Critical Care Medicine 33:A34. 2006.
5. Davis S, Labuda C, **Raymond JL**, Church CC, Bass H, Vaezy S, Brayman AA, Kargl SG, Crum LA, Morrison C. High-intensity focused ultrasound for hemorrhage control and hemostasis. Presented at Advanced Technology Applications for Combat Casualty Care Conference (ATACCC); St. Petersburg. August 2005.
4. Labuda C, Church CC, and **Raymond JL**. Reciprocity calibration of hydrophones at various temperatures in the MHz frequency range. J.Acoust.Soc.Am. 115:2377. 2004.

3. Hynynen K, McDannold NJ, King RL, Martin H, **Raymond JL**, Jolesz FA. Clinical large-scale MR-guided ultrasound phased array system. Proceedings of the 48th Meeting of the RRS/19th Meeting of the NAHS; San Juan, Puerto Rico. April 2001.
2. **Raymond JL**, King R, Hynynen K, Fleury G, and Berriet R. 1-3 Piezocomposite phased-arrays for MR-guided ultrasound surgery. Presented at Medical Ultrasound Transducer Engineering Conference; State College, PA. August 2000.
1. Wyatt SC, Thomas CR, **Raymond J**, Roy RA, and Holt RG. The impact of mass diffusion on SBSL dynamics in a variable-gravity environment. J.Acoust.Soc.Am. 106:2290. 1999.

GRANTS AND RESEARCH SUPPORT

Current and past direct research support

Agency	Dates / Amount	Role	Title
EPSRC UK Acoustics Network+	2022.05–2022.10 £59,258	Co-I (subc.)	Acoustic attenuation using advanced nanoporous materials. Subcontract from University of Sheffield (PI: K.Horoshenkov, EP/V007866/1)
EPSRC Therapeutic Ultrasound Network for Drug Delivery and Ablation Research	2021.05–2021.08 £50,000	PI (subc.)	Rapid three-dimensional mapping of HIFU-induced hyperthermia. Subcontract from Institute for Cancer Research (PI: G.ter Haar, EP/N026942/1) Output: Abstract [49]
EPSRC Image-Guided Therapy Network+	2019.03–2019.08 £50,000	Co-I (subc.)	Optical system for avoidance of high intensity focused ultrasound (HIFU) skin burns. Subcontract from King's College London (PI: S.Ourselin, EP/N027078/2) Output: Abstracts [46,48,50,55,56]
The Royal Society	2019.03–2022.03 £11,920	Co-I	Development of dual-modality droplets for contrast-enhanced imaging and therapy applications. International exchange cost share. (PI: R.A. Roy) Output: Papers [18,20]
Suzhou Industrial Park (Jiangsu, China)	2017.11–2021.12 £1,127,380	Co-I	Base funding to establish research programme in physical acoustics at the Oxford-Suzhou Centre for Advanced Research. Total funding (construction, equipment and running costs) for the Centre based in Suzhou, China is £35M/5-years. (PI: R.A. Roy)
Univ. of Oxford, Hester Cordelia Parsons Fund	2016.3–2017.12 £1,850	PI	A reactor for cavitation-enhanced bioremediation experiments on cell suspensions. Output: Paper [21], Report [9], Patent
Univ. of Cincinnati, Cardiovascular Center of Excellence	2012.3–2013.3 $10,900	Co-I	Pilot project: Ultrasound-triggered vasoreactivity using nitric oxide-loaded echogenic liposomes. (PI: C.K. Holland and J. Rubinstein) Output: Paper [10], Abstracts [23,25], Patent

Univ. of Cincinnati/ Sigma Xi	2011.3–2012.9 $6,994	PI	Sigma Xi Grant-in-aid of Research; in recognition of excellence in the advancement of scientific research and scholarship. Output: Papers [9,10,12,13,16], Abstracts [22,30]
USASMDC/ Impulse Devices Inc.	2007.6–2009.9 $650,000	Co-I (subc.)	Advanced Cavitation Power Technology: a multi-site effort to investigate the use of acoustic inertial confinement fusion as a potential power source. Subcontract from Impulse Devices, Inc. (PI: D.F. Gaitan, W9113M-07-C-0178) Output: Papers [2,3,5], Proceedings [5], Abstracts [12–16,18], Reports [6]
NIH	2006.8–2008.7 $26,857	Co-I (subc.)	Ultrasonic image guidance for HIFU cancer treatment. Subcontract from Tufts University (PI: E. Miller, R21 CA123253) Output: Proceedings [4]
USAMRAA	2003.1–2003.9 $151,287	PI (subc.)	Remote Acoustic Hemostasis and Other Applications of Image-Guided High Intensity Focused Ultrasound (HIFU) Therapy. Subcontract from Univ of MS. (PI: H.E. Bass & L.A. Crum, DAMD17-02-2-0014) Output: Proceedings [2], Abstracts [4], Reports [1]

Abbreviations:
- Co-I – Grants for which I made both a substantial contribution to the development of the application and was a co-investigator or named researcher on the award.
- subc. – subcontract
- CoE – Center of Excellence
- EPSRC – Engineering and Physical Sciences Research Council (UK)
- JITRI IMPACT – Jiangsu Industrial Technology Research Institute, Innovative Materials and Processes for Advanced and Critical Technologies
- NIH – National Institutes of Health
- USAMRAA – U.S. Army Medical Research Acquisition Activity
- USASMDC – U.S. Army Space & Missile Defense Command
- n.b. Fellowship support not included

Proposals submitted or in-preparation

"Development of dual-modality droplets for contrast-enhanced imaging and therapy applications," in collaboration with R.A. Roy and J.Tu, Nanjing University. Proposal to The Royal Society. *In preparation.*

RESEARCH EXPERIENCE

2017–	Senior Researcher, Dept. of Engineering Science, University of Oxford.
2015–2016	Research Fellow (supernumerary), Dept. of Engineering Science, University of Oxford.
2013–2014	Research Fellow (visiting 12-mo.), Thoraxcenter–Erasmus Medical Center, Rotterdam.
2009–2015	Research Engineer (PhD), Dept. of Internal Medicine, University of Cincinnati.
2004–2009	R&D Engineer, National Center for Physical Acoustics, University of Mississippi.
1999–2002	Research Assistant (MS), Radiology, Brigham and Women's Hospital, Harvard Medical School.
1998–1999	Research Assistant (BS), Dept. of Mechanical Engineering, Boston University.

TEACHING EXPERIENCE

2022– *Engineering Sustainability and the Environment* (level: undergrad, 3nd year). The need for sustainability in engineering. Principles of sustainability (economics, society, and environment). Sustainable development. Sustainability tools and metrics. Environmental legislation. Frameworks. Environmental impact assessments, Life cycle analyses, multi-criteria analysis, scenario planning.
Lecturer, 2022–

2020– *Biomedical Engineering: Ultrasonics* (level: undergrad, 2nd year). Introductory biomedical engineering course covering ultrasound medical imaging and therapy.
Lecturer, 2020–2022

2019– *Dynamics Laboratory* (level: undergrad, 2nd year). Matlab and Simulink simulations of linear and non-linear vibratory systems, damping, and resonance. Experimental measurements and analysis of normal modes of a scale-model 'shaky building' multiple degree-of-freedom system with forcing.
Faculty co-lead, 2021–
Demonstrator, 2019–2020

2019– *Biomedical Engineering: Ultrasonics Laboratory* (level: undergrad, 2nd year). Laboratory instruction on guidance and monitoring of non-invasive high-intensity focused ultrasound treatment and investigation of bioeffects produced in a tissue-mimicking phantom.
Faculty lead, 2020–2022
Demonstrator, 2019

2013 *Preparing Future Faculty Program*, Postbaccalaureate certificate, May 2013.
University of Cincinnati PFF in Engineering courses: *Modern Teaching Techniques*, *Advanced Teaching Techniques, Teach Me To Teach: Pedagogical Preparation Seminar*, *Projecting Classroom Authority*.

2011 *Introduction to Biomedical Engineering in the Clinical Environment*,
University of Cincinnati, Biomedical Engineering Program (level: 2nd year undergraduate). Introduction to clinical applications of medical devices and medical device development. Mentored teaching: prepared and delivered didactic lectures under mentor Professor C.K. Holland. Autumn 2011.

MENTORING AND STUDENT ADVISING

Research group supervision and mentorship

2021–2022 C K Ng, Postdoctoral Researcher, University of Oxford, Dept. of Engineering Science, Co-supervisor.

2019–2020 Y Yang, Recognized Student, University of Oxford, Dept. of Engineering Science, Research co-supervisor. Current position: Engineer at Tencent, Shenzhen.

2019–2019 J Chen, Senior Research Scientist, Oxford-Suzhou Centre for Advanced Research, Co-supervisor. Current position: Assoc Prof East China Normal Univ.

2006–2009 K Bader, Doctoral Student, University of Mississippi, Dept. of Physics, Research co-supervisor. Current position: Asst Prof of Radiology, Univ of Chicago.

2004–2007 D Woolworth, Physicist, National Center for Physical Acoustics, Research supervisor. Current position: Principal of consulting firm, Fellow of ASA.

Supervised Academic Reports

2022	Y Huang, Exeter College (co-advised); MEng research project, University of Oxford, Dept. of Engineering Science, “Laser-mediated Cavitation Nucleation with Gold Nano-particles.”
2020	Y Yang; Newton Fund: PhD Placement programme between the UK and China. Recognized Student, University of Oxford, Dept. of Engineering Science, “Development of dual-modality droplets for contrast-enhanced imaging and therapy applications.”
2020	S Oldroyd, St. Edmund Hall (co-advised); MEng research project, University of Oxford, Dept. of Engineering Science, “An Ultrasound Exposure System for Effecting Ultrasound-mediated Gene Transfer.”
2020	J Kirsch (co-advised); MEng research project, University of Oxford, Dept. of Engineering Science, “3D Printing of Historical Musical Instruments.”
2018	J Cochrane, Wadham College (co-advised); MEng research project, University of Oxford, Dept. of Engineering Science, “An acoustic cavitation reactor for quantifying the effect of cavitation on cell suspensions.”
2017	J Melia, Balliol College (co-advised); MEng research project, University of Oxford, Dept. of Engineering Science, “Monitoring therapeutic ultrasound in a tissue phantom using temperature sensitive dyes.”
2016	G Carruthers, St. Edmund Hall (co-advised); MEng research project, University of Oxford, Dept. of Engineering Science, “A very high intensity acoustic source.”
2014	R N, Franklin College (co-advised); ASPET SURF program, University of Cincinnati, “Acoustic characterization of nitric-oxide loaded bubble liposomes.”
2013	K Alley, L Boehm, J Price, A Wilms (co-advised); undergraduate capstone, University of Cincinnati, Medical Device Innovation Program, “Ultrasonic depth finder.”
2012	K Hiltz, Washington University; SURF Physician-Scientist Training Program, University of Cincinnati, “Acoustic characterization of bioactive gas-loaded echogenic liposomes.”
2012	J Griffin; undergraduate capstone, University of Cincinnati, Biomedical Engineering Program, “Quantitative characterization of gas-loaded liposomes.”
2011	T Fosnight (co-advised); undergraduate capstone, University of Cincinnati, Biomedical Engineering Program, “Effect of thermodynamic stresses on a new ultrasound contrast agent.”
2006	S Vuppala (co-advised); MS research, University of Mississippi School of Engineering, Dept. of Computer and Information Science, Technical Report #2006–04, “Software architecture for visualization of tissue temperature in ultrasound therapy.”