
Mark L. Palmeri, M.D., Ph.D.

Professor of the Practice

Departments of Biomedical Engineering & Anesthesiology

Pratt School of Engineering

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1 Online Profiles

- Google Scholar
- GitHub
- PubMed
- Publons
- ORCiD
- ResearcherID
- Scopus Author ID
- Bitbucket

2 Education

Duke University, Pratt School of Engineering, Durham, NC

B.S.E., Biomedical and Electrical Engineering (1996–2000)

Magna Cum Laude

Duke University, Pratt School of Engineering, Durham, NC

Ph.D., Biomedical Engineering (2002–2005)

Advisor: Dr. Kathy Nightingale, Ph.D.

“Imaging the mechanical properties of tissue with ultrasound: An investigation of the response of soft tissue to acoustic radiation force”

Duke University, School of Medicine, Durham, NC

M.D., (2000–2002, 2006–2007)

3 Research & Professional Experience

2017–Present **Chief Scientific Advisor**

MicroElastic, Inc.

Durham, NC

2017–Present **Founding Director BME Design Fellows**

Department of Biomedical Engineering

Duke University, NC

2016–Present	Associate Professor of the Practice Department of Biomedical Engineering Duke University, NC
2016–2016	Associate Research Professor Department of Biomedical Engineering Duke University, NC
2013–2018	Biomedical Engineering Consultant Human Pharmacology Lab, Department of Anesthesiology Duke University Medical Center, NC
2008–Present	Assistant Research Professor Department of Anesthesiology Duke University Medical Center, NC
2007–2016	Assistant Research Professor Department of Biomedical Engineering Duke University, NC
2005–2007	Research Associate Department of Biomedical Engineering Duke University, NC
2002–2005	Research Assistant Department of Biomedical Engineering Duke University, NC
1999–2000	NSF/ERC Undergraduate Fellow Department of Biomedical Engineering Duke University, NC
1998	Research Assistant Department of Electrical Engineering Princeton University, NJ
1997	Research Assistant Brookhaven National Laboratory SUNY Stony Brook, NY
1995–1997	Research Assistant Garnett McKeen Labs, Long Island High Technology Incubator SUNY Stony Brook, NY

4 Teaching & Student Advising Experience

4.1 Courses Taught

Spring 2020	Medical Device Design I (BME473L)	Professor
	Medical Device Design II (BME474L)	Professor
Fall 2019	Medical Device Design I (BME473L)	Professor, Course Developer
	Medical Device Design II (BME474L)	Professor, Course Developer
Spring 2019	Fundamentals of Biomedical Design (BME590L)	Professor
	Medical Device Design (BME464L)	Professor
Fall 2018	Fundamentals of Biomedical Design (BME590L)	Professor, Course Developer
	Medical Software Design (BME590L)	Professor
	Introduction to Biomedical Electronics (BME790L)	Professor
Spring 2018	Medical Device Design (BME464L)	Professor
	Medical Software Design (BME590)	Professor
Fall 2017	Medical Software Design (BME590)	Professor

	Introduction to Biomedical Electronics (BME790L)	Professor
	Fundamentals of Biomedical Design (BME590L)	Professor
Spring 2017	Introduction to Medical Instrumentation (BME354L)	Professor
	Medical Device Software & Hardware Design (BME790L)	Professor
Fall 2016	Medical Device Software Design (BME590)	Professor
	Medical Device Software & Hardware Design (BME790L)	Professor
Spring 2016	Medical Device Software & Hardware Design (BME790L)	Professor, Course Developer
Fall 2015	Medical Device Software & Hardware Design (BME790L)	Professor, Course Developer
Fall 2014	Medical Instrumentation (BME464L)	Professor
Spring 2014	Introduction to Medical Instrumentation (BME354L)	Professor
Spring 2014	Introduction to BME (BME008)	Guest Lecturer
Fall 2013	Medical Instrumentation (BME464L)	Professor
Spring 2013	Introduction to Medical Instrumentation (BME354L)	Professor
Spring 2012	Biomedical Electronic Measurements II (BME154L)	Professor
Spring 2011	Biomedical Electronic Measurements II (BME154L)	Professor
Spring 2010	Biomedical Electronic Measurements II (BME154L)	Professor
Spring 2009	Biomedical Electronic Measurements I (BME153L)	Professor

4.2 Teaching Assistant & Project Advisor

Spring 2020	Freshman Design II (EGR102L)	
	Advanced Biomedical Design I & II (BME790L)	
	Design Health	
Fall 2019	Freshman Design (Insulin Pen & Isolette Sound Reduction) (EGR101L)	
	Design Health	
Fall 2018	Freshman Design (Ethanol Injection, 2 Teams) (EGR101L)	
Fall 2017	Freshman Design (BrainWave Testing Jig) (EGR190L)	
Spring 2016	Intercontinental Engineering Design (BME590.04)	
Fall 2014	Imaging the Mechanical Properties of Tissue (BME790)	
Spring 2002–Present	Devices for People with Disabilities (BME260L/490L)	
Fall 2012	Imaging the Mechanical Properties of Tissue (BME790)	
Spring 2009	Design in Biotechnology (BME227)	
Fall 2007	Imaging the Mechanical Properties of Tissue (BME365)	
Fall 2005	Imaging the Mechanical Properties of Tissue (BME365)	
Spring 1998	Introduction to Electronic Devices (EE62L)	

4.3 Student Advising

4.3.1 Undergraduate, Graduate, and Medical Students

2020	Spencer Moavenzadeh	Undergraduate (BME Design Fellow)
	Eleanor Wood	Undergraduate
	Kathleen Embury	Undergraduate
	Steven Cheng	Undergraduate (ECE & CS)
2019	Michael Postiglione	Undergraduate (ECE)
	Rebecca Cohen	Undergraduate
	Stephen Xu	Undergraduate
	Tanvi Tarcar	Masters
	Jack Dozier	Undergraduate (BME Design Fellow)
	Ben Wesorick	Undergraduate (BME Design Fellow)

	Venezia Leone	Undergraduate (BME Design Fellow)
	Cooper Lair	Undergraduate (BME Design Fellow)
	Anthony-Fayez Haddad	Undergraduate (BME Design Fellow)
	Aimee McVey	Undergraduate (BME Design Fellow)
	Reagan Portelance	Undergraduate
2018	Brandyn Wong	Masters
2017	Morgan Ringel	Undergraduate
	Stacie Arechavala	Masters
	Daniel Hull	Undergraduate
	Katherine Lee	Undergraduate
	Varun Gudapati	Undergraduate
2016	Siji Oluwadara	Masters
	Katherine Lee	Undergraduate
2015	Claire Vannelli	Undergraduate
	Lauren Musso	Undergraduate
	Samuel Butensky	Undergraduate
	Fikret Yalcinbas	Undergraduate
	Eli Medvescek	Undergraduate
2012–2014	Kirema Garcia-Reyes	Medical
2014	Matthew Nagle	Undergraduate
	Hersh Desai	Undergraduate
	Jennifer Nichols	Undergraduate
	Jackson Morton	Undergraduate
2013–2014	Lucy Corippo	Undergraduate
2013	Morganne Gagne	Undergraduate
	Tyler Hobbs	Undergraduate
	Will Scheideler	Undergraduate
	Oliver Fang	Undergraduate
2012–2013	Zachary Miller	Undergraduate
2011–2012	Taylor Jordan	Undergraduate
2011–2012	Sarah Boltuck	Undergraduate
2010	Manu Lakshmanan	Graduate
2009–2011	Pamela Anderson	Undergraduate
2009–2011	Samantha Lipman	Undergraduate
2009	Samanthe Lyons	Undergraduate
2005	Kelly Fong	Undergraduate

4.3.2 Masters and Doctoral Thesis Committees

2020	Tanvi Tarcar, M.S. (BME) [Chair]
	Matthew Morgan, Ph.D. (BME)
	Rosa Araiza, M.S. (BME) [Chair]
	Vithika Nag, M.S. (BME) [Chair]
	Alex Shields, M.S. (BME)
	Adrianna Battle, M.S. (BME)
2019	Ouwen Huang, Doctoral Candidate (BME) [Chair]
	Felix Jin, Doctoral Candidate (BME) [Chair]
2018	Ismael Perez, M.S. (BME)
	Vibhav Kakkad, Ph.D. (BME)
	Brandyn Wong, M.S. (BME)
	Annette Caenen, Ph.D. (Ph.D. Opponent, Gent University, Belgium)

Cody Morris, Doctoral Candidate (BME)
 Katie Flint, Doctoral Candidate (BME)
 Chris Lam, Ph.D. (BME)
 2017 Shuja Rayaz, M.S. (BME)
 Garren Angacian (BME, Chair)
 Zui Dighe (Grand Challenge Scholars Program)
 Inje Lee, M.S. (BME)
 Jingrui Li, M.S. (BME)
 Brandon Nichols, Ph.D. (BME)
 2016 Erik Widman, Ph.D. (Ph.D. Opponent, KTH University, Sweden)
 Mercy Asiedu, M.S. (BME)
 Adam Pely, M.S. (BME)
 Keaton Armentrout, M.S. (BME)
 Nicholas Bottenus, Ph.D. (BME)
 2015 Caryn Urbanczyk, M.S. (BME)
 2014 Joshua Doherty, Ph.D. (BME)
 Peter Hollender, Ph.D. (BME)
 Sharmila Palani, M.S. (BME)
 2013 Stephanie Eyerly, Ph.D. (BME)
 Veronica Rotemberg, Ph.D. (BME)
 2011 Andy Homyk, M.S. (BME) [Chair]
 Douglas Dumont, Ph.D. (BME)
 2010 Richard Bouchard, Ph.D. (BME)
 Christina Li Hsu, Ph.D. (BME)

5 University & Professional Service

- COVID-19 Engineering Response Team (2020)
- Phoenix Project Mentor (Summer 2020)
- Purposefully Duke: Reimagining Engineering Education for Purpose, Character and Ethics (2020–present)
- IEC-TC87-WG9 Ultrasound Shear Elasticity Committee Member (2019–present)
- Founding Director of BME Design Fellows Program (2018–present)
- Duke Information Technology Advisory Council (ITAC) (2019–present)
- Pratt School of Engineering Learning Commons Committee (2019–present)
- Pratt School of Engineering Design Health Advisory Board (2018–present)
- Triangle Health Innovation Challenge (THInC) Technical Mentor (2019)
- KEEN Network Leader (2018–present)
- Design Health Steering Committee (2018–present)
- Committee on Computing in the Pratt Undergraduate Curriculum (2017–2018)
- BME Masters Affairs Committee (MAC), Chair (2018–present)
- BMES Coulter College: Undergraduate Design Competition Faculty Advisor (2017)

- Biological Sciences Undergraduate Research Fellowship (BSURF) Seminar (2017)
- Duke CIT Active Learning Fellowship (2017)
- BME Design Task Force [Chair] (2016–2018)
- BME Strategic Planning Committee (2016–2017)
- Pratt Non-Tenure Reform EFC Subcommittee (2016)
- Duke MedX Faculty Member (2015–present)
- Faculty Member for the 9th International Symposium on Focal Therapy and Imaging in Prostate and Kidney Cancer (2016)
- Associate Editor for Clinical Applications, Ultrasound in Medicine and Biology (2012–present)
- Associate Editor, IEEE Transactions in Medical Imaging (2014–2019)
- RSNA Quantitative Imaging Biomarkers Alliance (QIBA) Quantitative Imaging Data Warehouse (QIDW) Oversight Committee (2016–2019)
- RSNA Quantitative Imaging Biomarkers Alliance (QIBA) Magnetic Resonance Elastography Committee Member (2015–present)
- Medical Scientist Training Program Steering Committee (2006–present)
- Medical Scientist Training Program Interviewer (2006–present)
- Medical Scientist Training Program Admissions Committee (2012–present)
- Associate Editor, Ultrasonic Imaging (2014–2016)
- National Institutes of Health Ad Hoc Grant Reviewer (2014–present)
- RSNA Quantitative Imaging Biomarkers Alliance (QIBA) Ultrasound Systems Dependence Subcommittee Co-Chair (2012–present)
- RSNA Quantitative Imaging Biomarkers Alliance (QIBA) Shear Wave Speed Ultrasound Technical Committee (2012–present)
- Ph.D. Plus Speed Mentoring Faculty Participant (2015)
- Society of Radiologists in Ultrasound Consensus Committee on Ultrasound Elastography for Assessment of Diffuse Liver Disease (2014–present)
- American Institute of Ultrasound in Medicine (AIUM) Technical Standards Committee Resource Member (2014–present)
- Campus/DUMC IRB Forum (2015)
- PhD+ Workshop Mentor (2015)
- Grant Reviewer for Technology Foundation STW (Netherlands) (2012–2016)
- Grant Reviewer, The Research Foundation–Flanders (FWO) (2014)
- UITS Special Section Organizer: Shear Wave Imaging (2011)
- Advisory Editorial Board, Ultrasound in Medicine and Biology (2011–2012)

- Associate Editor, Medical Physics (2009)
- Session Chair, IEEE Ultrasonics Symposium (2007, 2009, 2011, 2017, 2019)
- Scientific Abstract Reviewer, Ultrasonic Measurement and Imaging of Tissue Elasticity Conference (2009–2011, 2018)
- Consultant for Cerene Biomedics (2009–2011)
- Institutional Review Board (IRB) Member, Duke University Medical Center (2002–2007)
- Faculty Mentor, Medical Scientist Training Program Annual Retreat (2010)
- Session Chair, Ultrasonic Measurement and Imaging of Tissue Elasticity Conference (2007, 2008, 2010, 2011)
- Scientific Session Moderator, AIUM Annual Convention (2008, 2009, 2015)
- Reviewer for Journal of Biomechanics, Annals of Biomedical Engineering, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, Computer Methods and Programs in Biomedicine, Physics in Medicine and Biology, Medicinal Research Reviews, BioMed Central, Ultrasound in Medicine and Biology, Ultrasonic Imaging, Ultrasonics, Physiological Measurement, Transactions on Medical Imaging, Transactions on Biomedical Engineering, Measurement Science and Technology, Journal of Gastrointestinal and Liver Diseases, Current Medical Imaging Reviews, Medical Ultrasonography, Biomedical
- Duke University Alumni Admissions Advisory Committee (2008–2011)
- Duke Medicine Young Alumni Committee (2011–2016)
- Pratt School of Engineering Academic Integrity Charrette (2012)
- Duke University Graduate School Alumni Lunch for Engineers Panelist (2012)
- Duke University Health Professions Advising Committee (2012)

6 Professional Societies

- Institute of Electrical and Electronics Engineers (1998–present)
- Biomedical Engineering Society (2007–present)
- American Institute of Ultrasound in Medicine (2007–present)
- Radiological Society of North America (2014–2019)
- International Anesthesia Research Society (2008–2010)
- American Medical Association (2004–2007)

7 Awards & Honors

- Design Faculty Mentor for Fall 2019 BME Design Symposium Faculty Design Award (“BacZap”) and People’s Choice Award (“image3D”) and People’s Choice Award First Runner-up (“ProLung”)
- Design Faculty Mentor for 2019 Innovate Carolina Conference Graduate Product Development and Design Competition (“Radical Prostatectomy Surgical Margin Detection”)
- Dean’s Award for Excellence in Teaching (2018)
- BMES Coulter College “Best Overall Final Venture Capital Pitch” [Faculty Mentor] (2017)
- Lois and John L. Imhoff Distinguished Teaching Award (2017)
- MedX Colloquium Award: “Imaging Skin: New Approaches to Assess Pathogenesis and Diagnosis in Skin”
- IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control Editors Selected Articles
 - “Characterization of Viscoelastic Materials Using Group Shear Wave Speeds” (June 2019, April 2020)
 - “Guidelines for Finite-Element Modeling of Acoustic Radiation Force-Induced Shear Wave Propagation in Tissue-Mimicking Media” (March & August 2018)
 - “Ultrasonic Shear Wave Elasticity Imaging Sequencing and Data Processing Using a Verasonics Research Scanner” (Oct 2017, May 2018)
 - “Analysis of Rapid Multi-Focal-Zone ARFI Imaging” (May 2017)
 - “Estimation of Shear Wave Speed in the Rhesus Macaques’ Uterine Cervix” (December 2016)
 - “On System-Dependent Sources of Uncertainty and Bias in Ultrasonic Quantitative Shear-Wave Imaging” (August 2016)
- Featured in Ultrasound Quarterly 32(2): “Elastography Assessment of Liver Fibrosis: Society of Radiologists in Ultrasound Consensus Conference Statement” (June 2016)
- Editor-Recognized Highly-Cited Articles in IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control
 - “Derivation and analysis of viscoelastic properties in human liver: impact of frequency on fibrosis and steatosis staging” (Oct 2015; Apr, Sept, Nov 2016; Jan, Mar Apr 2017)
 - “Ultrasonic Shear Wave Elasticity Imaging Sequencing and Data Processing Using a Verasonics Research Scanner” (June, Sept 2018)
- Duke Senior Class Faculty Honoree (2016)
- Duke Intellectual Community Planning Grant (2015–2016)
- Pratt School of Engineering Certificate for Excellence in Teaching (2015)
- RSNA Quantitative Imaging Biomarker Alliance (QIBA) Certificate of Appreciation (2014)
- BME464 Student Project Award: 2014 Lemelson-MIT National Collegiate Student “Cure It” Competition Finalist for Chymos Needle Project (2014)
- Student Paper Award Mentor: SY Lee “Assessment of cutaneous sclerotic disorders using ARFI/SWEI”, *12th International Tissue Elasticity Conference*, (2013)

- Lois and John L. Imhoff Distinguished Teaching Award (2012)
- Featured on NIH NIBIB Website: “New Ultrasound Technique Developed for Diagnosing and Tracking Liver Fibrosis and Tumors” (2012)
- Featured in Medical Physics Web: “Tissue stiffness helps track liver disease” (2012)
- Featured in Anesthesiology News 37(1): “Injection Visualization Improved with Ultrasound Algorithm” (2011)
- Featured in DukeMed Alumni News “The Translators” (Fall 2008)
- James B. Duke Graduate Fellowship (2002–2005)
- IEEE-UFFC Student Travel Award (2004)
- Magna Cum Laude with Distinction (2000)
- Helmholtz Undergraduate Research Award (2000)
- Howard G. Clark Award, Department of Biomedical Engineering (2000)
- Finalist in UF National BMES Competition (1999)
- Undergraduate Research Support Grant (1999)
- Phi Eta Sigma National Honor Society (1999)
- Golden Key National Honor Society (1998)
- Tau Beta Pi National Engineering Society (1996)

8 Invited Talks, Seminars and Presentations

- [1] **M. L. Palmeri**, “Imaging tissue mechanical properties using impulsive acoustic radiation force,” in *Interdisciplinary Inverse Problems (IPRPI)*, Troy, NY, 2004.
- [2] —, “[short course] elasticity imaging: Dynamic approaches,” in *Proc. IEEE Ultrason. Symp.*, New York, NY, 2007.
- [3] —, “Ultrasound beamforming and image formation,” in *Radiological Society of North America (RSNA) Scientific Assembly and Annual Meeting Refresher Course*, Chicago, IL, 2007.
- [4] —, “Cutting edge of ultrasound research,” in *Carolina Cadaver Course (Dept. of Anesthesiology)*, Durham, NC, 2008.
- [5] —, “Shear wave analysis: Clinical implications,” in *American Institute of Ultrasound in Medicine*, San Diego, CA, 2008.
- [6] —, “[short course] elasticity imaging: Dynamic approaches,” in *Proc. IEEE Ultrason. Symp.*, Rome, Italy, 2009.
- [7] —, “[hot topic] ultrasound elastography: Is it in our future?” In *RSNA Annual Meeting*, Chicago, IL, 2010.
- [8] —, “Acoustic radiation force impulse imaging and novel ultrasonic imaging modalities,” in *Medical Scientist Training Program Annual Retreat Faculty Speaker*, Wilmington, NC, 2010.
- [9] —, “[hot topic] mr elastography and quantitative us elastography: Emerging applications,” in *RSNA Annual Meeting*, Chicago, IL, 2011.

- [10] —, “[short course] elasticity imaging: Dynamic approaches,” in *Proc. IEEE Ultrason. Symp.*, Orlando, FL, 2011.
- [11] —, “Biological foundations and clinical applications of soft tissue elasticity imaging,” in *Intl. Tissue Elasticity Conf.*, Arlington, TX, 2011.
- [12] —, “Clinical translation of biomedical engineering research,” in *Biomedical Engineering Seminar*, Durham, NC, 2011.
- [13] —, “Quantitative shear wave elasticity imaging techniques to noninvasively characterize soft tissue stiffness,” in *Applied Inverse Problems Conference (AIPC)*, College Station, TX, 2011.
- [14] —, “Using quantitative shear wave elasticity imaging techniques to noninvasively characterize liver fibrosis,” in *Ultrasonic Imaging and Tissue Characterization Symposium*, Arlington, VA, 2011.
- [15] —, “Acoustic radiation force-based shear wave elasticity imaging to quantitatively characterize soft tissue stiffness,” in *American Institute of Ultrasound in Medicine*, Phoenix, AZ, 2012.
- [16] —, “Evolving prostate cancer imaging: Achieving results through multidisciplinary collaboration,” in *Radiology Grand Rounds*, Durham, NC, 2013.
- [17] —, “Investigation of the use of increased acoustic output levels for acoustic radiation force impulse imaging in the research setting,” in *American Institute of Ultrasound in Medicine*, New York, NY, 2013.
- [18] —, “Shear wave speed quantification for staging liver fibrosis,” in *Ultrasonic Imaging and Tissue Characterization Symposium*, Arlington, VA, 2013.
- [19] —, “[short course] elasticity imaging: Dynamic approaches,” in *Proc. IEEE Ultrason. Symp.*, Chicago, IL, 2014.
- [20] —, “Basic science: System-dependent measurement variability and phantom testing,” in *Society of Radiologists in Ultrasound Consensus Conference on Ultrasound Elastography for Assessment of Diffuse Liver Disease*, Denver, CO, 2014.
- [21] —, “Elastography: State of the art 2014 (principles),” in *American Institute of Ultrasound in Medicine*, Las Vegas, NV, 2014.
- [22] —, “Ultrasonic tissue elasticity imaging: Numerical, experimental and clinical development,” in *Imaging Technology Fair*, Durham, NC, 2014.
- [23] —, “[short course] elasticity imaging: Dynamic approaches,” in *Proc. IEEE Ultrason. Symp.*, Taipei, Taiwan, 2015.
- [24] —, “Digital and tissue-mimicking phantom studies to achieve platform-independent shear wave speed measurements,” in *American Institute of Ultrasound in Medicine*, Orlando, FL, 2015.
- [25] —, “Opportunities to diagnose and monitor cutaneous sclerosis using ultrasonic acoustic radiation force shear wave imaging,” in *Duke Skin Disease Research Center*, Durham, NC, 2015.
- [26] —, “[short course] elasticity imaging: Dynamic approaches,” in *Proc. IEEE Ultrason. Symp.*, Tours, France, 2016.
- [27] —, “[webinar] system-dependent factors influencing shear wave speed measurements for liver fibrosis characterization,” in *American Institute of Ultrasound in Medicine*, 2016.
- [28] —, “Acoustic radiation force and shear wave elasticity imaging: From simulation to commercialization,” in *Vanderbilt Institute in Surgery and Engineering*, 2016.
- [29] —, “Acoustic radiation force impulse and shear wave elasticity imaging for improved tumor detection,” in *MUSIC Inaugural Lecture*, Radboudumc in Nijmegen, Netherlands, 2016.
- [30] —, “Research elastography: Basic science,” in *American Institute of Ultrasound in Medicine*, New York, NY, 2016.

- [31] —, “Translating Acoustic Radiation Force Impulse (ARFI) and Shear Wave Elasticity Imaging from Models to Clinical Practice,” in *KTH University*, Sweden, 2016.
- [32] —, “[short course] elasticity imaging: Methods and applications,” in *Proc. IEEE Ultrason. Symp.*, Washington DC, 2017.
- [33] —, “Characterizing small structures with acoustic radiation force and shear waves,” in *American Institute of Ultrasound in Medicine*, 2017.
- [34] —, “Shear wave speed: Becoming a clinically valuable biomarker,” in *IEEE Int. Ultrason. Symp. IUS*, Washington DC, 2017, ISBN: 9781538633830. DOI: 10.1109/ULTSYM.2017.8091948.
- [35] —, “Simulating ultrasound wave propagation in soft tissues on micron-to-meter scales,” in *Duke Research Computing Symposium*, 2017.
- [36] —, “Standardizing intermanufacturer liver fibrosis shear wave speed measurements using viscoelastic tissue-mimicking phantoms,” in *American Institute of Ultrasound in Medicine*, 2017.
- [37] —, “ARFI and shear wave imaging of the prostate to delineate clinically-significant cancers,” in *World Federation Ultrasound Med. Biol.*, Melbourne, Australia, 2019.
- [38] —, “Constructive shear wave interference imaging to characterize skin sclerosis,” in *World Federation Ultrasound Med. Biol.*, Melbourne, Australia, 2019.
- [39] —, “RSNA/QIBA efforts to standardize shear wave speed as a biomarker for liver fibrosis staging,” in *World Federation Ultrasound Med. Biol.*, Melbourne, Australia, 2019.

9 Patents

- [1] K. R. Nightingale, G. E. Trahey, R. W. Nightingale, and **M. L. Palmeri**, “Method and apparatus for the identification and characterization of variations in tissue stiffness,” 6,371,912, 2002.
- [2] —, “Method and apparatus for the identification and characterization of regions of altered stiffness,” 6,951,544, 2005.
- [3] **M. L. Palmeri**, K. R. Nightingale, G. E. Trahey, and K. D. Frinkley, “Methods, systems and computer products for ultrasound shear wave velocity estimation and shear modulus reconstruction,” US8118744B2, 2007.
- [4] G. Johnson, G. Howles-Banerji, K. Bing, K. R. Nightingale, and **M. L. Palmeri**, “Method and apparatus for delivery of agents across the blood brain barrier,” US20100143241A1, 2008.
- [5] **M. L. Palmeri**, D. B. MacLeod, S. A. Grant, J. J. Dahl, and K. R. Nightingale, “Ultrasound methods, systems and computer program products for imaging fluids,” US20100241001A1, 2009.
- [6] **M. L. Palmeri**, V. M. Rotemberg, S. J. Rosenzweig, and K. R. Nightingale, “Ultrasound methods, systems and computer program products for imaging contrasting objects using combined images,” US8398549B2, 2010.
- [7] **M. L. Palmeri**, S. L. Lipman, and K. R. Nightingale, “Ultrasound methods, systems and computer program products for imaging fluids using acoustic radiation force,” US20120143042A1, 2012.
- [8] S. J. Rosenzweig, N. C. Rouze, B. C. Byram, **M. L. Palmeri**, and K. R. Nightingale, “Methods, systems and computer program products for estimating shear wave speed using statistical inference,” US10451587B2, 2014.
- [9] B. C. Byram, K. Walsh, D. M. Dumont, and **M. L. Palmeri**, “Ultrasound device and method for estimating tissue stiffness,” US20160367220A1, 2015.
- [10] P. J. Hollender and **M. L. Palmeri**, “Ultrasound transducers for constructive shear wave interference and related methods and systems,” WO2017223312A1, 2016.

- [11] **M. L. Palmeri** and K. R. Nightingale, “Methods, systems and computer program products for constructive shear wave ultrasound imaging,” US20190041506A1, 2016.
- [12] N. C. Rouze, **M. L. Palmeri**, and K. R. Nightingale, “Systems and methods for determining viscoelastic properties in soft tissue using ultrasound,” US20180098752A1, 2016.
- [13] M. Bishawi and **M. L. Palmeri**, “Systems, devices, and methods for noninvasively monitoring blood pressure in a user,” WO2020117737A1, 2018.

10 Peer-Reviewed Publications (h-index: 46 / i10-index: 102)

- [1] K. R. Nightingale, R. W. Nightingale, **M. L. Palmeri**, and G. E. Trahey, “A finite element model of remote palpation of breast lesions using radiation force: Factors affecting tissue displacement,” *Ultrason. Imaging*, 2000, ISSN: 01617346. DOI: 10.1177/016173460002200103.
- [2] K. Nightingale, **M. Palmeri**, R. Nightingale, and G. Trahey, “On the feasibility of remote palpation using acoustic radiation force,” *J. Acoust. Soc. Am.*, vol. 110, no. 1, 2001, ISSN: 00014966. DOI: 10.1121/1.1378344.
- [3] **M. Palmeri** and K. Nightingale, “On the thermal effects associated with radiation force imaging of soft tissue,” *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, vol. 51, no. 5, 2004, ISSN: 08853010. DOI: 10.1109/TUFFC.2004.1320828.
- [4] **M. L. Palmeri**, K. D. Frinkley, and K. R. Nightingale, “Experimental studies of the thermal effects associated with radiation force imaging of soft tissue,” *Ultrason. Imaging*, 2004, ISSN: 01617346. DOI: 10.1177/016173460402600203.
- [5] G. Trahey, **M. Palmeri**, R. Bentley, and K. Nightingale, “Acoustic radiation force impulse imaging of the mechanical properties of arteries: In vivo and ex vivo results,” *Ultrasound Med. Biol.*, vol. 30, no. 9, 2004, ISSN: 03015629. DOI: 10.1016/j.ultrasmedbio.2004.07.022.
- [6] B. Fahey, K. Nightingale, S. McAleavey, **M. Palmeri**, P. Wolf, and G. Trahey, “Acoustic radiation force impulse imaging of myocardial radiofrequency ablation: Initial in vivo results,” *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, vol. 52, no. 4, pp. 631–641, 2005, ISSN: 08853010. DOI: 10.1109/TUFFC.2005.1428046.
- [7] B. J. Fahey, K. R. Nightingale, R. C. Nelson, **M. L. Palmeri**, and G. E. Trahey, “Acoustic radiation force impulse imaging of the abdomen: Demonstration of feasibility and utility,” *Ultrasound Med. Biol.*, 2005, ISSN: 03015629. DOI: 10.1016/j.ultrasmedbio.2005.05.004.
- [8] K. Gentry, **M. Palmeri**, N. Sachedina, and S. Smith, “Finite-element analysis of temperature rise and lesion formation from catheter ultrasound ablation transducers,” *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, vol. 52, no. 10, 2005, ISSN: 08853010. DOI: 10.1109/TUFFC.2005.1561625.
- [9] **M. L. Palmeri**, K. D. Frinkley, L. Zhai, M. Gottfried, R. C. Bentley, K. Ludwig, and K. R. Nightingale, “Acoustic Radiation Force Impulse (ARFI) imaging of the gastrointestinal tract,” *Ultrason. Imaging*, pp. 75–88, 2005, ISSN: 01617346. DOI: 10.1177/016173460502700202.
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12 Book Chapters

- [1] **M. L. Palmeri** and S. A. Grant, “Acoustic Radiation Force Imaging in Regional Anesthesia,” in *Ultrasound Guidance for Regional Anesthesia and Pain Management*, P. Bigeleisen, Ed., Lippincott Williams & Wilkins, 2009.
- [2] K. Nightingale and **M. Palmeri**, “Acoustic Radiation Force Impulse (ARFI) Imaging: Fundamental Concepts and Image Formation,” in *Biomed. Appl. Vib. Acoust. Imaging Charact.* M. Fatemi and A. Al-Jumaily, Eds., ASME Press, 2010. DOI: 10.1115/1.802731.ch5.
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- [5] **M. L. Palmeri**, “Characterizing Liver Stiffness with Acoustic Radiation Force,” in *Liver Elastography*, S. Mueller, Ed., 2020. DOI: 10.1007/978-3-030-40542-7_4.

13 News

- COVID-19 Engineering Response Team Assembles from Every Corner of Duke
- Duke researchers leverage deep learning on Google Cloud to improve medical imaging quality
- **Palmeri, ML**. “QIBA Ultrasound SWS Phantom Project: Phases I & II,” QIBA Newsletter, April 2014 [http://rsna.org/QIBA_Quarterly_April.2014/].
- **Palmeri, ML**. “Collaborative Efforts of the MRE and US SWS Biomarker Committees,” QIBA Newsletter, January 2017 [<https://www.rsna.org/QIBA-Newsletter-2017-January/>].
- **Palmeri, ML**. “The value of open-source tools and shared data for US SWS performance testing and profile conformance,” *Analysis: Tool & Techniques, QIBA Newsletter*, Feb 2020.
- 2019 PDMA Carolinas Chapter Announces Student Competition Winner
- <https://bme.duke.edu/about/news/year-real-world-design>
- <https://bme.duke.edu/about/news/path-post-grad-success>
- <https://bme.duke.edu/about/news/showcase-bme-design>
- <https://medx.duke.edu/happenings/news/hungry-innovation-notable-project-stems-medx-dinner>

14 Funding

14.1 Active

1. **EASI: Shear Wave Elastography Assessment For Predicting Success Of Labor Induction.** *National Institutes of Health (R01)*, \$21,047 (PI) [2018-09-07 – 2020-08-31]
2. **Ultrasound-Based Device to Guide Treatment of Graft-Versus-Host-Disease using Skin Elasticity as a Biomarker.** *National Institutes of Health (STTR, Phase II)*, \$126,106 (PI) [2019-03-01 – 2021-02-28]

3. **Image-guided Targeted Biopsy of Clinically-significant Prostate Cancer with Acoustic Radiation Force.** *National Institutes of Health*, \$414,948 (Investigator, PI: Nightingale) [2010-01-18 – 2022-07-31]
4. **Prototyping Skills Challenge Expansion for all Duke Engineers / Students.** *Lord Foundation*, \$15,200 (PI) [2019-07-01 – 2020-06-30].
5. **Duke MEDx BME Design Fellows Support.** *Duke MEDx*, ~\$5,000-\$7,500 annually (PI) [2017 – 2020]

14.2 Pending

1. **3D Ultrasonic Shearwave Elasticity Imaging of Skeletal Muscle.** *National Institutes of Health (R01)*, \$250,000 (Investigator, PI: Nightingale) [2020-2025]
2. **Planning for a multi-site randomized controlled trial of respiratory muscle training in late-onset Pompe disease.** *National Institutes of Health (R34)*, \$150,000 (Co-PI) [2019-08-01 – 2021-07-31]

14.3 Completed

1. **BME Design Fellows Medical Center Summer Internships.** *Lord Foundation*, \$40,000 (PI) [2018-07-01 – 2019-09-30]
2. **Monitoring Changes in Cervical Microstructure During Pregnancy.** *National Institutes of Health (R01)*, \$22,665 (PI) [2017-01-15 – 2018-12-31]
3. **Quantifying Cervical Softness with Elasticity Imaging.** *National Institutes of Health (R01)*, \$21,654 (PI). [2012-09-01 – 2013-08-31]
4. **Ultrasound-Based Device to Guide Treatment of Graft-Versus-Host-Disease Using Skin Elasticity as a Biomarker.** *National Instituted of Health (STTR, Phase I)*, \$149,999 (PI) [2017-11-21 – 2018-11-20]
5. **Constructive Shear Wave Interference Measurement in Liver and Skin.** *Wallace H. Coulter Translational Grant Program*, \$169,941 (Co-PI) [2016 – 2017]
6. **Prostate Cancer Assessment via Integrated 3D ARFI Elasticity Imaging and Multi-Parametric MRI.** *National Institutes of Health (STTR)*, \$74,980 (PI). [2015-04-01 – 2016-03-31]
7. **Development and validation of simulations and phantoms mimicking the viscoelastic properties of human liver.** *National Institutes of Health, RSNA Quantitative Imaging Biomarker Alliance*, \$8,800 (PI) [2014 – 2016]
8. **Viscoelastic Characterization of Skin using Shear Wave Elasticity Imaging** *Duke Skin Research Center and Pinnell Center for Investigative Dermatology Translational and Innovative Research Support Program*, \$22,065 (PI) [2015-08-03 – 2016-07-31]
9. **Single Track Location Shear Wave Elasticity Imaging of Liver.** *Wallace H. Coulter Translational Grant Program*, \$93,220 (Co-PI) [2015 – 2016]
10. **Analysis of Sources of US SWS Measurements Inter-System Variability.** *National Institutes of Health, RSNA Quantitative Imaging Biomarker Alliance*, \$53,000 (PI) [2014-07-01 – 2016-12-30]
11. **Numerical Simulation of Shear Wave Speed Measurements in the Liver.** *FDA Statement of Work #1136030*, \$10,000 (PI) [2015-2016]

12. **Quantifying Liver Fibrosis with Acoustic Radiation Force.** *National Institutes of Health* (Investigator, PI: Nightingale).
13. **Early Detection of Clinically Significant Prostate Cancer using Ultrasonic Acoustic Radiation Force Impulse (ARFI) Imaging.** *Department of Defense, \$125,000* (Investigator, PI: Nightingale) [2016-09-15 – 2019-09-14]
14. **Improved Ultrasound Imaging Using Elevated Acoustic Output.** *National Institutes of Health, \$284,550* (Investigator, PI: Nightingale) [2016-01-01 – 2020-12-31]
15. **Ultrasound Technologies.** *Duke University Intellectual Community Planning Grant, \$5,000* (PI) [2015 – 2016]