

## CURRICULUM VITAE

### **K. Kirk Shung**

#### *PERSONAL:*

Born June 2, 1945, US citizen, Married (wife: Linda), Three Children (Albert, Simon and May).

#### *ADDRESS AND TELEPHONE:*

Department of Biomedical Engineering, 140 Denney Research Bldg., University of Southern California, Los Angeles, CA 90089-1111.

Telephone Number: 213/821-2653 (office), FAX : 213/821-3897

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#### *EDUCATION:*

University of Washington, Seattle, WA, Ph.D. in Electrical Engineering, 1975

University of Missouri, Columbia, MO, M.S. in Electrical Engineering, 1970

National Cheng-Kung University, Taiwan, B. S. in Electrical Engineering, 1968

#### *PROFESSIONAL EXPERIENCE:*

Dwight C. and Hildagarde E. Baum Chair, Department of Biomedical Engineering, University of Southern California, Los Angeles, CA, 2018 – present.

Endowed Dean's Professor in Biomedical Engineering, University of Southern California, Los Angeles, CA, 2013 – 2018.

Professor, Department of Biomedical Engineering, University of Southern California, Los Angeles, CA, 2002 – present.

Director, NIH Resource on Medical Ultrasonic Transducer Engineering, 1997 - 2018.

Honorary Professor, Division of Biomedical Engineering, Hong Kong Polytechnic University, Hong Kong, 2016-present.

Chair Professor, Department of Applied Physics, Hong Kong Polytechnic University, Hong Kong, 2007 – 2012.

Visiting Professor, Institute of Biomedical Engineering, National Yang-Ming University, Taipei, Taiwan, July-October, 2008.

Distinguished Professor, Department of Bioengineering, Pennsylvania State University, University Park, PA, 2001- 2002.

Director, Whitaker Center for Medical Ultrasonic Transducer Engineering, Pennsylvania State University, University Park, PA, 1994-1997.

Professor, Department of Bioengineering, Pennsylvania State University, University Park, PA, 1989 - 2000.

Acting Chairman, Bioengineering Program, Pennsylvania State University, University Park, PA, 1987 - 1988.

Associate Professor, Bioengineering Program, Pennsylvania State University, University Park, PA, 1985-1989.

Assistant Professor, Bioengineering Program, Pennsylvania State University, University Park, PA, 1979 - 1985.

Research Bioengineer, Providence Medical Center, Seattle, WA, 1976 - 1979.

Research Scientist, Institute of Applied Physiology and Medicine (joint appointment), Seattle, WA, 1977 -1979.

Postdoctoral Research Fellow, Providence Medical Center, Seattle, WA, 1975 - 1976.

Research Assistant, Center for Bioengineering and Department of Electrical Engineering, University of Washington, Seattle, WA, 1970-1975.

#### *HONORS:*

- (1) Outstanding Research Award, College of Engineering, Pennsylvania State University, University Park, PA, 1984.
- (2) Early Career Achievement Award, IEEE Engineering in Medicine and Biology Society (EMBS), 1985.
- (3) Premier Research Award, College of Engineering, Pennsylvania State University, University Park, PA, 1999.
- (4) Best paper award, IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, 2000.
- (5) Outstanding alumnus award, National Cheng-Kung University, Taiwan, 2001.
- (6) Distinguished lecturer Award for 2002-2003, IEEE Ultrasonics, Ferroelectrics and Frequency Control Society.
- (7) Chau Wai-Yin Memorial lecturer on Science and Science Education, Hong Kong Polytechnic University, Hong Kong, 2005.
- (8) Senior Faculty Research Award, Viterbi School of Engineering, University of Southern California, 2008.
- (9) Joseph R. Holmes Pioneer Award in Basic Sciences, American Institute of Ultrasound in Medicine, 2010.
- (10) Academic Career Achievement Award, IEEE Engineering in Medicine and Biology Society, 2011.
- (11) IEEE Biomedical Engineering Award, IEEE, 2016.

#### *PROFESSIONAL SOCIETIES:*

Life Fellow, 2011, fellow, 1993-2010, Institute of Electrical and Electronic Engineers (IEEE)

IEEE Ultrasonics Symposium Technical Program Committee, 1987-2010.

Awards Committee, IEEE Ultrasonics, Ferroelectrics and Frequency Control Society, 2004-2013. IEEE Biomedical Engineering Award committee, 2016-present.

Founding Fellow, American Institute of Medical and Biological Engineering, 1992.

Fellow Selection Committee, 1992 – 2006, Chair, Subcommittee on Medical Imaging, 2002 – 2004.

Fellow, American Institute of Ultrasound in Medicine, 1991, member since 1981.

Abstract Selection Committee for Annual Conference, 1986-2006, 2011, 2012.

Central Convention Program Committee, 1997-1998.

Technical Standards Committee, 1989-1992, 1994-1997  
Membership Committee, 1985-1988  
Constitution Committee, 1983-1985  
Life Member, World Association of Chinese Biomedical Engineers, 2002-present.  
President-elect, 2009-2011  
President, 2011-2013  
Immediate Past President, 2013-2015

*TEACHING:*

At Penn State University

1. Graduate Course BioE 506, 3 credits, "Medical Imaging" 1980-2002.
2. Graduate Course BioE 516, 3 credits, "Ultrasonic Imaging" 1985-2002.
3. Senior Level Course BioE 402, 3 credits, "Biomedical Instrumentation" 1979 - 2002.
4. Senior Level Course BioE 403, 1 credit lab, "Biomedical Instrumentation" 1979-2002.
5. Graduate Course BioE 536, 3 credits, "Ultrasonic Transducer Engineering" 1994-2002.

At USC

1. Graduate Course BME 535, 3 credits, "Ultrasonic Imaging" Spring, 2003 - present.
2. Graduate Course BME 536, 3 credits, "Ultrasonic transducers" Fall, 2004 - present.
3. Graduate Course BME533, 1 credit, "Biomedical Engineering Seminar", Fall, 2011, Spring, 2016.

*STUDENT THESIS SUPERVISION:*

Sixty Ph.D. theses and 20 M.S. theses.

*UNIVERSITY ACTIVITIES*

At Penn State University

Chair, Bioengineering Program Curriculum Committee, 1980-1985  
Chair, Bioengineering Faculty Search Committee, 1986-1988  
Bioengineering Faculty Search Committee, 1997-2001  
Bioengineering Department Promotion and Tenure Committee, 1990-2001, chair, 2000-2001  
College of Engineering Promotion and Tenure Committee, 1997-1999, 2000-2002  
College of Engineering Faculty Council, 1983-1986, 1992-1995, secretary, 1994-1995  
College of Engineering Sabbatical Leave Committee, 1994-1995  
College of Engineering Space Committee, 1990-1991  
College of Engineering Chemical Engineering Department Head Evaluation Committee, 1989  
Acoustics Program faculty committee, 1985-2002

At USC

Faculty Search Committee in Diagnostic Devices, 2002-2003  
School of Engineering Promotion and Tenure Committee, 2004-2006, 2012-2014  
Executive Committee, School of Engineering Promotion and Tenure Committee, 2005-2006, 2012-2014.  
Research Committee, School of Engineering, 2007-2008.

Awards Committee, School of Engineering, 2007-present.  
Graduate Admissions Committee, Department of Biomedical Engineering, 2007-2010.  
Engineering Faculty Council, 2008 – 2009.  
BME Promotion and Tenure Committee, Chair, 2008-2009.  
Faculty Search Committee in computational bioengineering, 2009-2010.  
BME Promotion and Tenure Committee, 2013-2014.  
Viterbi School of Engineering BME Awards coordinator, 2013-present.  
Chair, Faculty Search Committee in imaging, 2015-2016  
Chair, Admission committee, 2015-2016

*HIGHLIGHTS OF RECENT PROFESSIONAL ACTIVITIES:*

- \* Member, Advisory Committee, NIH P41 Center “Multimodality Imaging of Engineered Tissues” Case Western Reserve University, Cleveland, OH, 2016-present.
- \* Honorary Professor, Division of Biomedical Engineering, Hong Kong Polytechnic University, Hong Kong, 2015-present.
- \* Member, Advisory Committee, College of Biomedical Engineering, Taipei Medical University, Taipei, Taiwan, 2015-present.
- \* Member, National Health Research Institute (Taiwan) Medical Engineering Study Section, 1997-present.
- \* Member, Advisory Committee, National Health Research Institute (Taiwan) Medical Engineering Division, 2000-present.
- \* Collaborating faculty, Ultrasonic Transducer Engineering, University College of Southeast Norway Horten, Norway, 2016-2019.
- \* Member of USC delegation to Chung-Yuan Christian University, Taiwan, Dec. 2018.
- \* Member, IEEE Biomedical Engineering Award committee, 2017-2019.
- \* Member, Fellow Selection Committee, IEEE Ultrasonics, Ferroelectrics and Frequency Control Society, 2018.
- \* NIH Quantum Grant Review Panel, July, 2016, 2017.
- \* NIH Biomedical Imaging Technology Study Section A, June 2015.
- \* NIH Bioengineering Partnership Grant review panel, Oct., 2014.
- \* NIH SBIR/STTR Grant review panel, March, 2014.
- \* NIH S-10 Shared Instrumentation grant application review panel, March, 2014
- \* Review panel for NIH P41 grant application, University of Washington, March, 2014
- \* NIH R15 Grant Review Panel, Nov., 2013.
- \* NIH Bioengineering Partnership Review Panel, Nov. 2013
- \* Site visitor for NIH P41 grant application, University of California at Davis, Davis CA, June, 2013
- \* Site visitor for NIH P41 grant application, University of Minnesota, Minneapolis, MN, Oct, 2012
- \* Medical Imaging Theme Co-Chair, IEEE International Conference on Engineering in Medicine and Biology (EMBC 12), October, 2012, San Diego, CA.
- \* Member, Technical Program Committee, Ultrasonic Signal Processing and Imaging Conference, SPIE Medical Imaging Symposium, 2003-2014.
- \* Member of Technical Program Committee, LASTED Biomedical Engineering Conference, Innsbruck, Austria, 2004-present.
- \* Member of Technical Program Committee, IEEE International Symposium on Biomedical Imaging, 2005-2013.

- \* President, World Association of Chinese Biomedical Engineers, 2011-2013.
- \* President, Chinese American Faculty Association of Southern California, 2011-2012.
- \* Member, Institute Review Committee, National Health Research Institute, Taiwan, April. 2012.
- \* Ad-hoc member, NIH Medical Imaging Technology Study Section, San Francisco, CA, Feb. 2012.
- \* NIH Fellowship Review Panel, Oct., 2011, 2012.
- \* NIH S-10 Shared Instrumentation Review Panel, July, 2011.
- \* NIH NCI SBIR Phase II Bridge Funding Review Panel, Washington, DC, July, 2011, 2012.
- \* Member of Technical Program Committee, IEEE Ultrasonics Symposium, 1987-2010.
- \* Chair, Annual Conference on Medical Ultrasonic Transducer Engineering, 1994, 1995, 2000, 2001, 2003, 2004, 2005, 2007, 2008, 2010, 2013, 2014, 2016.
- \* Member of Advisory Committee, ASME Frontier in Biomedical Devices Conference, Irvine, CA, September, 2010.
- \* Ad-hoc member of NIH medical imaging study section, San Diego, CA, CA, Feb. 2009, 2010
- \* Site visitor for NIH P41 grant application, Harvard Medical School, Boston, MA, Nov. 2009.
- \* Member of NIH Ad-Hoc Committee to review GO grants, Wash. DC, CA, July, 2009
- \* Cardiovascular Bioengineering Theme Co-Chair, IEEE International Conference on Engineering in Medicine and Biology (EMBC 09), September, 2009, Minneapolis, MN.
- \* Ad-hoc member of NIH Shared Instrumentation study section, San Francisco, CA, June, 2009, 2010
- \* Member, Advisory Committee, Biomedical Engineering Center, Industrial Technology Research Institute, Taiwan, 2003-2008.
- \* Chair, Biomedical Engineering Society Annual Conference, Los Angeles, CA, 2007
- \* Chair, 6<sup>th</sup> Ultrasonic Biomedical Microscanning Conference, Los Angeles, CA, 2008
- \* Member, Advisory Committee, Singapore-University of Washington Alliance in Bioengineering, 2004-2008.
- \* Ultrasound track chair, IEEE International Conference on Engineering in Medicine and Biology (EMBC 08), August, 2008, Vancouver, Canada
- \* Member of NIH ad-hoc committee for reviewing BRP applications, Seattle, WA, Oct. 2008
- \* Member, Test Development Task Force on Physics, American Registry on Medical Diagnostic Ultrasonographers, 1994-2000, 2006- 2008.
- \* Ad-hoc member of NIH medical imaging study section, Washington, DC, June, 2007, 2008
- \* Appointed honorary guest professor at Xian Jiao-Tong University, Xian, China, 2008-2011.
- \* Site visitor for NIH National Center for Research Resource at Duke University, Durham, NC, Feb., 2008
- \* Site visitor for NIH National Center for Research Resource at University of California at Irvine, Nov., 2007
- \* Member of special Study Section for ultrasonic imaging, San Diego, CA, Feb., 2007
- \* Ad-hoc member of NIH medical imaging study section, Silver Spring, MD, May, 2006
- \* Member of NIH ad-hoc committee for reviewing BRP applications, Silver Spring, MD, May, 2006
- \* Member of NIH ad-hoc committee for reviewing an NCI program project on elastography, May, 2006
- \* Appointed guest professor, Wuhan University of Science and Technology, China, Dec., 2005, for a 3 year term.
- \* Site visitor for NIH National Center for Research Resource at MIT, Boston, MA, Oct., 2005
- \* Ad-hoc member of NIH medical imaging study section, San Diego, CA, Feb., 2005
- \* Member, Scientific Committee, Advanced Metrology for Ultrasound in Medicine Conference,

Teddington, UK, April, 2004

- \* Member, Scientific Committee, 2<sup>nd</sup> World Congress of Chinese Biomedical Engineers, Beijing, China, September, 2004.
- \* Chair, NIH SBIR Study Section, Bethesda, MD, Oct., 2004
- \* Member, NIH SBIR Study Section, Bethesda, MD, July, 2004, July 2005.
- \* Member of NCI Ad-hoc Study section for academia-industry collaborative research, Bethesda, MD, March, 2004
- \* Ad-hoc member of NIH medical imaging study section, San Diego, CA, Feb., 2004
- \* Member of NCI study section for Innovative technology in cancer imaging, DC, Nov. 2003
- \* Member of NIH Ad-hoc study section for Bioengineering Partnership, DC, July, 2003
- \* Ad-hoc member of NIH study sections, Bioengineering Partnership and Diagnostic Radiology, San Diego, CA, Feb., 2003
- \* IEEE UFFC society distinguished lecturer, 2002-2003
- \* Site visitor for NIH National Center for Research Resource at Duke University, Durham, N.C., Jan., 2003
- \* Reverse site visitor for NIH National Center for Research Resource for a program project at Rutgers University, Washington, D.C., June, 2002
- \* Appointed guest professor, Shanghai Jiao-Tong University, June, 2002 for a 3 year term.
- \* Co-Chair, Ultrasonic Signal Processing and Imaging Conference, SPIE Medical Imaging Symposium, 2000-2001.
- \* Site visitor for NIH National Center for Research Resource for a program project at Los Alamos Laboratory, Los Alamos, New Mexico, Oct., 2001.
- \* Site visitor for NIH National Center for Research Resource for a program project at Rutgers University, New Brunswick, N.J., April, 2001.
- \* NIH Study Section member for reviewing the Bioengineering Partnership grant applications, July, 1999 and March, 2000
- \* Site visitor for National Cancer Institute for a program project at University of Texas Health Sciences Center, Houston, TX, March 1999.
- \* Site visitor for NIH National Center for Research Resource for a program project at University of Memphis, Memphis, TN, November, 1998.
- \* Site visitor for National Institute of Aging of NIH for a program project at Washington University, St. Louis, MO, March, 1998.
- \* Awarded a NIH resource grant on medical ultrasonic transducer technology for 3.5 million dollars from 1997 through 2001, October, 1997, renewed in 2001 for 5 years, and renewed in 2006 for 5 years.
- \* Chair, Ultrasonic Transducer Conference, SPIE Medical Imaging Symposium, 1996-1999.
- \* Awarded one of the first Whitaker Special Opportunity Awards in 1994 to establish a center on medical ultrasonic transducer engineering at Penn State University.
- \* Manuscript reviewer for Journal of Acoustical Society of America, IEEE Trans. on Biomedical Engineering, IEEE Trans. on Ultrasonics, Ferroelectrics and Frequency Control, IEEE Trans on Medical Imaging, Ultrasound in Medicine and Biology, Biorheology, Physiological Measurements (UK), Physics in Medicine and Biology (UK), Ultrasonics.
- \* Proposal reviewer for NSF, Hospital for Sick Children in Toronto, Research Foundation, Henry Ford Hospital, National Health Research Institute (Taiwan), National Research Council (Canada), Industrial Technology Research Institute (Taiwan).
- \* Invited seminar Speaker at Universities and other organizations: Universities of Toronto (1989),

Virginia (1990), and Pittsburgh (1994), Washington (1997), Virginia (1998), Johns Hopkins (2000), Texas A and M (2002), Vermont (2002), University of Washington (2002), National Seoul University, Korea, National Pukyong University, Korea (2002), Chung-Yuan University, Taiwan (2002), Shanghai Chiao-Tong University, China (2002), Tohoku University, Japan (2002), Toshiba, Japan (2002), Aloka, Japan (2002), Rockwell (2003), Erasmus University, Holland (2003), Ruhr University, Bochum, Germany (2003), University of Illinois, Urbana (2003), Marquette University (2003), University of Vienna, Austria (2003), University of Montreal, Canada (2003), Carnegie-Mellon University, Pittsburgh, (2003), University of Colorado, Boulder, CO (2004), National University of Singapore (2004), Nanyang Technological University, Singapore (2004), Case Western Reserve University (2005), Hong Kong Polytechnic University (2005), Wuhan University, China (2005), Wuhan University of Science and Technology, China (2005), Hubei University, China (2005), Washington State University (2006), Wuhan University of Science and Technology, Wuhan, China (2007), University of California at Davis (2007), Xian Jiao-Tong University, China (2008), National Taiwan University, Taiwan (2008), National Cheng Kung University, Taiwan (2008), Kaohsiung Veterans General Hospital, Taiwan (2008), Taichung Veterans General Hospital, Taiwan (2008), National Yang-Ming University, Taiwan (2008), Chung Yuan Christian University, Taiwan (2008), Fu-Jen Catholic University, Taiwan (2008), University of Hong Kong, Hong Kong (2008), Amgen Inc., Thousand Oaks, CA (2009), University of California at Irvine (2009, 2010), Columbia University (2010), Tongji University, China (2010), Sogang University, Korea (2010), Hong Kong Polytechnic University, Hong Kong (2010), LA Chapter, Acoustical Society of America (2011), IEEE Photonics Society at UCLA (2011), Tsing-Hua University, China (2012), Samsung, Korea (2012), Florida International University, Miami, FL (2013), National Cheng Kung University, Taiwan (2013), North Carolina State University, Raleigh, NC (2013), Tongji University, China (2013), National Tsing Hua University, Taiwan (2013), Shanghai Jiao Tong University, China (2013), National Cheng Kung University, Taiwan (2015), Taipei Medical University, Taiwan (2015), Hong Kong Polytechnic University, Hong Kong, (2015), UC-San Diego (2016), Beihong University, Beijing, China (2017), Penn State Univ (2017), UCLA (2018), **Univ of Minn (2019)**.

- Invited speaker at recent international and national conferences:

International Symposium of Frontier Acoustics, Shenzhen, China, December, 2017 (Plenary Speaker).

International Conference on Biomedical Ultrasound, Hong Kong, December, 2017 (Plenary speaker).

International Ultrasonics Symposium, Washington, DC, September, 2017 (Plenary Speaker)

8<sup>th</sup> World Congress of Chinese Biomedical Engineers, Hong Kong, July-August, 2017 (Plenary Speaker).

Material Research Society Spring meeting, Phoenix AR, April, 2017.

2017 Cellular and Molecular Bioengineering Conference, Hawaii, January, 2017.

University College of Southeast Norway 2<sup>nd</sup> Ultrasound Transducer Workshop, Vestfold, Norway, September, 2016

2nd Global Conference on Biomedical Engineering, Taipei, Taiwan, August, 2016 (Plenary speaker)

National Health Research Institute Annual Symposium on Biomedical Sciences, Zhupei, Taiwan (Plenary speaker), August, 2016.

IEEE International Symposium on Biomedical Imaging, Prague, April, 2016 (Plenary Speaker)

7<sup>th</sup> World Congress of Chinese Biomedical Engineers, Singapore, July, 2015 (Keynote Speaker).

9<sup>th</sup> Asian Pacific Conference on Medical and Biological Engineering, Tainan, Taiwan, Oct, 2014 (Keynote Speaker)

2014 International Ultrasonics Symposium, Chicago, Ill, September, 2014.

Ultrasonic Imaging Workshop, Shenzhen University, Shenzhen, China, June, 2014 (Plenary Speaker.

NIH P41 Directors' Meeting, Rockville, MD, March, 2014.

166<sup>th</sup> meeting of Acoustical Society of America, San Francisco, CA, Dec. 2013.

Annual Conference, Taiwanese Biomedical Engineering Society, Nov, 2013 (plenary speaker)

6<sup>th</sup> World Congress of Chinese Biomedical Engineers, Beijing China, August, 2013 (keynote speaker).

Korean Society of Ultrasound in Medicine, Seoul, Korea, May, 2013.

American Institute of Ultrasound in Medicine Annual Conference, New York City, April, 2013.

International Conference on Orange Technologies, Tainan, Taiwan, March, 2013 (plenary speaker)

Hong Kong Acoustics 2012, Hong Kong, May, 2012.

5<sup>th</sup> National Conference on Piezoelectric and Acoustic Devices, Shenzhen, China, Dec. 2011, (plenary speaker).

Toin University of Yokohama Biomedical Engineering Symposium, Yokohama, Japan, Nov., 2011 (plenary speaker).

5<sup>th</sup> World Congress of Chinese Biomedical Engineers, Tainan, Taiwan, August, 2011 (plenary speaker).

2011 Congress of World Federation of Ultrasound in Medicine and Biology, Vienna, Austria, September, 2011.

7<sup>th</sup> International Conference on Ultrasonic Biomedical Microscanning, Sendai, Japan, September, 2010.

Annual Conference of American Institute of Ultrasound in Medicine, San Diego, CA, March, 2010.

The Engineers' council 7<sup>th</sup> Annual National eWeek Technical Conference, Northridge, CA, Feb., 2010.

The 3<sup>rd</sup> International Conference on the Development of Biomedical Engineering in Vietnam, Ho Chi-Ming City, Vietnam, January 10-13, 2010 (plenary lecturer).

Annual Conference of IEEE Engineering in Medicine and Biology Society (EMBC09), Minneapolis, MN, September, 2009.

4<sup>th</sup> Congress of World Association of Chinese Biomedical Engineering, Hong Kong, July 2009 (plenary speaker)

SPIE Short Course Lecturer at US Patent and Trademark Office, Alexandria, VA, June, 2009.

Texas Instrument Technology Development Conference, Dallas, TX, Feb., 2008.



International Meeting on Smart Materials and Devices, Hong Kong Polytechnic University, Hong Kong, Dec. 2007.

International Congress of Acoustics, Madrid, Spain, September, 2007

2<sup>nd</sup> International Vietnamese Biomedical Engineering Conference, Hanoi, Vietnam, July, 2007 (keynote speaker)

International Conference on Frontiers of Biomedical Imaging Sciences, Vanderbilt University, Nashville, TN, June, 2007

2007 NIH P-41 Center Directors' meeting, Bethesda, MD, June, 2007

2007 American Institute of Ultrasound in Medicine annual Conference, New York City, March 2007

5<sup>th</sup> Ultrasonic Biomedical Scanning Conference, Cargese, Corsica, France, September, 2006

Keynote speaker, 9<sup>th</sup> Western Pacific Acoustics Conference, Seoul, Korea, June, 2006

Keynote speaker, Annual Conference of Taiwanese Biomedical Engineering Society, Chung-Li, Taiwan, Dec., 2005

2005 American Institute of Ultrasound in Medicine annual Conference, Orlando FL, June 2005

Ultrasonic Industry Association 34<sup>th</sup> Annual Symposium, Las Vegas, March, 2005

International Congress of ASME, Anaheim, CA, November, 2004

2<sup>nd</sup> World Congress of Chinese Biomedical Engineers, Beijing, China, September, 2004

4<sup>th</sup> Ultrasonic Biomedical Microscanning Conference, Harriman, New York, September, 2004

Spring Meeting of Acoustical Society of America, New York City, June, 2004

US-Taiwan Biomedical Engineering Conference, Taipei, Taiwan, June, 2004

Sigma-Xi Lecture, National Institute of Standards and Technology, Gaithersburg, MD, Oct., 2003

European Engineering and Medicine Conference, Halle, Germany (September, 2003)

German Medical Ultrasonics Conference, Bregenz, Austria (September 2003)

Ultrasonics International Conference, Granada, Spain (July, 2003)

American society of Echocardiography, Las Vegas (June, 2003)

1<sup>st</sup> World Congress of Chinese Biomedical Engineers, Taipei, Taiwan (December, 2002)

Ultrasonic Electronics Conference, Kanazawa, Japan (November, 2002)

Korean Acoustical Society Annual Meeting (November, 2002)

3<sup>rd</sup> Biomedical Microscanning Conference, Holland (September, 2002)

Acoustical Society of America Spring Meeting, Pittsburgh, PA (June, 2002)

Nanjing University in China 100 Anniversary Forum on 21st Century Acoustics (June, 2002)

Northeast Bioengineering Annual Conference, Philadelphia (April, 2002)

American Institute of Ultrasound in Medicine, Nashville, TN (March, 2002)

5<sup>th</sup> International Conference on Theoretical and Computational Acoustics, Beijing (May, 2001)

Pacific Asia Biomedical Engineering Conference, Hangzhou, China (Sept., 2000)

2<sup>nd</sup> Ultrasonic Microscanning International Conference, Toronto, Canada (Sept., 2000)

Principal Investigators' Meeting, NCCR, NIH (July, 2000)

Medical Electronics Conference, National Health Research Institute, Taiwan (June, 2000)

10th International Congress on Biorheology, Pecs, Hungary (July, 1999).

1999 Northeast Bioengineering Conference, Hartford, CT (April, 1999).

1999 Annual Convention of American Institute of Ultrasound in Medicine, San Antonio, TX

- (March, 1999)
- 5th Congress of Asian Federation on Ultrasound in Medicine, Taipei, Taiwan (October, 1998)
- Seminar on Biomedical Ultrasonic Measurements, Poland, Warsaw (September, 1998)
- Opening address, 2nd Quantitative Ultrasonography Symposium, Halle, Germany (March, 1998)
- American Society of Non-Destructive Evaluation (October, 1997)
- UC-San Diego Ultrasonic Contrast Agent Conference (February, 1997)
- Biomedical Engineering Society Annual Meeting (October, 1996)
- Acoustical Society of America Fall meeting (November, 1996)
- Republic of China Biomedical Engineering Society Annual Meeting (November, 1996)
- Republic of China Medical Ultrasound Society Annual Meeting (September, 1996)
- Sensors Expo 95, Chicago, IL (September 1995)
- Ultrasonics International, Edinburgh, UK (July, 1995)
- World Congress on Biorheology, Big Sky, Montana (July, 1995)
- 8th New England Doppler Conference, Ontario, Canada (June, 1995)
- 20th International Conference on Ultrasonic Imaging and Tissue Characterization, Wash., D.C. (June, 1995)
- New Initiatives on Vascular Diseases, Bethesda, MD (March, 1995)
- ASME Winter Annual Meeting, Chicago, IL (Nov, 1994)
- World Congress on Medical Physics and Biomedical Engineering, Brazil (August, 1994)
- Leading Edge in Ultrasound Conference, Atlantic City, N.J. (May, 1994)
- International Conference on Echocardiology in Rotterdam, Holland (June, 1993).
- \* External Ph.D. degree examiner at Turku University in Finland (1990), University of Toronto in Canada (1991), Erasmus University in Holland (1993), Queens University in Canada (1997), Queens University in Canada (1998), and University of Toronto in Canada (1998), Nanyang Technical University, Singapore (2005, 2010).

### *EDITORIAL POSITIONS*

- \* Associate Editor, IEEE Transactions on Biomedical Engineering, 2012-present.
- \* Associate Editor, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 1998-present
- \* Associate Editor, Medical Physics, 2013 - present.
- \* International Editorial Board, Journal of Medical Ultrasound, 1994-present.
- \* International Editorial Board, Journal of Medical and Biological Engineering, 2008 – present.
- \* Associate Editor, Medical Imaging Theme, IEEE International Conference on Engineering in Medicine and Biology, 2008-2015.
- \* Guest editor, IEEE Engineering in Medicine and Biology Magazine Special Issue on Ultrasonics in Medicine, November, 1996.
- \* Guest editor, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control Special Issue on Ultrasonic Transducers and Arrays, September, 1997.
- \* Editor, SPIE Conference Proceedings Volume 3037 “Ultrasonic Transducer Engineering”, 1997.
- \* Editor, SPIE Conference Proceedings Volume 3341 “Ultrasonic Transducer Engineering”, 1998.
- \* Editor, SPIE Conference Proceedings Volume 3664 “Ultrasonic Transducer Engineering, 1999.
- \* Editor, SPIE Conference Proceedings Volume 3983 “Ultrasonic Imaging and Signal Processing”,

2000

\* Editor, SPIE Conference Proceedings Volume 4325 “Ultrasonic Imaging and Signal Processing”, 2001

### *CONSULTING*

Jonhson and Johnson, Miles Laboratories, ATL, Abbott Laboratories, and Stryker Instruments.

### *CURRENT RESEARCH SUPPORT:*

1. NIH Grant # 1 R01 GM126016-02 “Remote-Control Mechano-Genetics and Epigenetics for Live Cell Manipulation” UCSD, YW Wang, P.I. USC subcontract \$72,000 (total cost), 2019 - 2020. KK Shung, P.I., 10% effort.

### *PENDING SUPPORT*

1 R01 CA246302-01A1 “High Frequency Ultrasound (HFU) induced mechano-genetic/epigenetic modulation for Cancer immunotherapy” \$1,600,000 (total cost), 2020-2024, KK Shung, P.I., 30%. Submitted Nov, 2019.

### *PAST SUPPORT*

1. NIH grant # P41 EB2182 “A Resource on ultrasonic transducer technology” 1997-2018, total cost: \$120,000,000.
1. NIH Grant # R01-HL079976-06 “Development of a high frame ultrasonic system for cardiac imaging in small animals” 2005-2013, total cost: \$1,100,000.
2. NIH Grant #R21-EB005201-02 “Development of Acoustic Tweezer” 2008-2009, total cost: \$200,000, KK Shung, P.I., 20%.
3. NIH Bioengineering Partnership Grant #R01-HL067647-05 “High frequency intracardiac catheter mounted ultrasonic miniature arrays” 2001-2007, D Sahn (Oregon Health Sciences University), P.I. Total cost (USC portion): \$300,000, KK Shung, P.I. 5%.
4. NIH Grant # R01-EB00712 “High resolution optoacoustic imaging” 2002-2006, L. Wang (Texas A and M University), P.I. Total cost (USC portion): \$500,000, KK Shung, P.I. 5%.
5. NIH Grant #R01-EB00274 "Ultrasonic Scattering by Biological Tissues" 1983-2003, total cost: \$2,500,000.
6. NIH SBIR Phase II Grant “High Intensity ultrasonic probe for prostate surgery” 2002-2004, N. Sanghvi (Focus Surgery, Inc.), P.I., total cost (USC portion): \$120,000, KK Shung, P.I., 5%.
7. Whitaker Foundation Special Opportunity Award "Medical Ultrasonic Transducer Engineering" 1994-1997, total cost: \$720,000. KK Shung, P.I., 25% effort.
8. Mercury Diagnostics, Inc. Grant “Ultrasound Enhanced Drug Delivery” 1997-1998, total cost: \$24,000. KK Shung, co-investigator, 5% effort, D Edwards (Chemical Engineering), P.I.
9. Echocath, Inc. NIH SBIR Phase I subcontract “Ultrasonic Blood Flow Measurements Using Diffractive Transducers” 1995-1996, total cost: 15,000. KK Shung, P.I.
10. Molecular Biosystems, Inc. Grant “Ultrasonic Characterization of Contrast Agents” 1990-1993, total cost: \$150,000, KK Shung, P.I.

11. NIH Grant "Ultrasonic Contrast Flowmetry" 1991-1993, Total Cost: \$200,000. KK Shung, P.I.
12. NIH Grant "Early Detection of Cardiac Rejection by Ultrasound" 1986-1989, Total cost: \$350,000. KK Shung, P.I.
13. NIH Grant "Ultrasonic Instrumentation for Sickle Cell Analysis" 1980-1983, Total cost: \$150,000. KK Shung, P.I.
14. Johnson and Johnson Grant "Development of Ultrasonic Tissue Mimicking Phantom" 1982-1983, total cost: \$45,000. KK Shung, P.I.
15. NSF Grant "Ultrasonic Instrumentation for Hematology" 1977-1981, total cost: \$180,000. KK Shung, P.I.

### *PATENTS*

1. J.A. Williams, J.M. Cannata, R. Liu, K.K. Shung, "Post positioning for interdental bonded composite," US Patent no. 2008/0020153, Jan. 2010.
2. M. Humanyun, X. Xu, Q.F. Zhou, K.K. Shung, "Intraocular Ultrasound Doppler Techniques" US Patent no. 8684935, April, 2014.
6. J. S. Jeong, J. H. Chang, K. K. Shung, "Ultrasonic apparatus and method for real-time simultaneous therapy and diagnosis," US Patent no. 2009/0240148 A1, Sept. 2009.
7. J.S. Jeong, and K.K. Shung, "Adaptive high intensity focused ultrasound (HIFU) noise cancellation for simultaneous therapy and imaging using integrated transducer," PCT Application publication, No. : 61/312,989, March 2010.
8. J.S. Jeong, and K.K. Shung, "Method to extend depth-of-field of high intensity focused ultrasound transducer," PCT Application publication, No. : 61/234,171, August 2010.
9. J.M. Cannata, J.A. Williams, K.K. Shung, "Curved ultrasonic array transducers," US Patent Pub. No. US 2010/0171395 A1, July 2010.
10. Q.F. Zhou, B.P.. Zhu and K.K. Shung, "Self-Separated thick films for high frequency ultrasonic transducer" PCT Application No. 61/297373, July, 2010.

### *PUBLICATIONS*

391 refereed papers and book chapters, 223 proceeding papers, and four books.

### ***PUBLICATIONS OF K. KIRK SHUNG***

#### *BOOKS*

1. Shung, K.K., Smith, M. and Tsui, B. "Principles of Medical Imaging" Academic Press, San Diego, CA, 1992.
2. Shung, K.K. and Thieme, G.A. (Eds.) "Ultrasonic Scattering in Biological Tissues" CRC Press, Boca Raton, FL, 1993.

3. Shung K.K. “Diagnostic Ultrasound: Imaging and Blood Flow Measurements” Francis Taylor: CRC Press, Boca Raton, FL, 2005.

4. Shung K.K. “Diagnostic Ultrasound: Imaging and Blood Flow Measurements, 2<sup>nd</sup> Edition” Francis Taylor: CRC Press, Boca Raton, FL, 2015.

#### *JOURNALS AND PROCEEDINGS*

1. Shung, K.K. (Ed) “Biomedical Ultrasonics” Special Issue of IEEE Engineering in Medicine and Biology magazine, Nov., 1996.

2. Shung, K.K. (Ed) Proceedings of SPIE Medical Imaging 1997 “Ultrasonic Transducer Engineering”, vol. 3037, April, 1997.

3. Shung, K.K. (Ed) “Ultrasonic Transducers” Special Issue of IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, Sept., 1997.

4. Shung, K.K. (Ed.) Proceedings of SPIE Medical Imaging 1998 “Ultrasonic Transducer Engineering”, vol. 3341, May, 1998.

5. Shung, K.K. (Ed.) Proceedings of SPIE Medical Imaging 1999 “Ultrasonic Transducer Engineering”, vol. 3664, June, 1999.

6. Shung, K.K. and Insana M.F. (Ed.) Proceedings of SPIE Medical Imaging 2000 “Ultrasonic Imaging and Signal Processing”, vol. 3982, June, 2000.

7. Insana M.F. and Shung, K.K. (Ed.) Proceedings of SPIE Medical Imaging 2001 “Ultrasonic Imaging and Signal Processing”, vol. 4325, June, 2001.

#### **REFERRED PUBLICATIONS**

1. Shung, K.K., R.A. Sigelmann, G. Schmer. Ultrasonic Measurements of Blood Coagulation Time. IEEE Trans. Biomed Eng, BME-22:334-337, 1975.

2. Shung, K.K., R.A. Sigelmann, J.M. Reid. The Scattering of Ultrasound by Blood. IEEE Trans Biomed Eng, BME-23:460-467, 1976.

3. Shung, K.K., R.A. Sigelmann and J.M. Reid. The Scattering of Ultrasound by Red Blood Cells, in Ultrasonic Tissue Characterization, M. Linzer, ed. NBS Special Publication No:493, Wash DC, 207-212, 1976.

4. Shung, K.K., R.A. Sigelmann, J.M. Reid. The Angular Dependence of the Scattering of Ultrasound from Blood. IEEE Trans Biomed Eng, BME-24:325-331, 1977
5. Shung, K.K., J.M. Reid. The Acoustical Properties of Deoxygenated Sickle Cell Blood and Hemoglobin Solutions. Ann Biomed Eng 5:151-156, 1977.
6. Shung, K.K. and J.M. Reid. Ultrasound Velocity in Major Bovine Blood Vessel Walls. J. Acoust Soc Am 64:692-695, 1978.
7. Reid, J.M. and K.K. Shung. Quantitative Measurements of the Scattering of Ultrasound by Heart and Liver. Ultrasonic Tissue Characterization II, M. Linzer, ed. NBS Special Publication No:525, Wash DC, 153-156, 1979.
8. Shung, K.K., M.L. Lee, J.M. Reid, C.A. Finch. Effects of Oxygen Tension and PH on Ultrasonic Absorption of Sickle Cells. Blood, 54:451-460, 1979.
9. Shung, K.K. and J.M. Reid. Ultrasonic Instrumentation for Hematology. Ultrasound Imaging, 1:280-294, 1979.
10. O'Brien, W.D., J. Olerud, K.K. Shung, J.M. Reid. Quantitative Acoustical Assessment of Wound Maturation with Acoustic Microscopy. J. Acoust Soc Am 69:575-579, 1981.
11. Shung, K.K., M. Rocco, J.O. Ballard. Ultrasonic Absorption in Deer Blood. J Acoust Soc Am 70:664-668, 1981.
12. Geleskie, J.V. and K.K. Shung. Further Studies on the Acoustic Impedance of Major Bovine Blood Vessel Walls. J Acoust Soc Am 71:467-470, 1982.
13. Shung, K.K. and J.M. Dzierzanowski. Effect of Phase Cancellation on Ultrasonic Scattering Measurements. Ultrasonic Imaging 4:56-70, 1982.
14. Savakus, A.D., K.K. Shung, N.B. Miller. Distortions of Ultrasonic Field Introduced by Rib Cage in Echocardiography. J Clin Ultrasound 10:413-419, 1982.
15. Shung, K.K., B.A. Krisco, J.O. Ballard. Acoustic Measurements of Erythrocyte Compressibility. Journal of the Acoustical Society of America, 72:1364-1367, 1982.
16. Shung, K.K. On the Ultrasound Scattering from Blood as a Function of Hematocrit. IEEE Trans Sonics Ultrasonics, SU-29:327-331, 1982.
17. Shung, K. K. An Alternative Approach for Formulating the Backscattering Equation in Sigelmann and Reid's Method. J Acoust Soc Am 73:1384-1386, 1983.

18. Shung, K.K. Physics of Blood Echogenicity. *J. Cardiovascular Ultrasound* 2:401-406, 1983.
19. Shung, K.K., D.Y. Fei, Y.W. Yuan. Ultrasonic Characterization of Blood During Coagulation. *J. Clin Ultrasound* 12:147-153, 1984.
20. Shung, K.K., Y.W. Yuan, D.Y. Fei, J.M. Tarbell. Effect of Flow Disturbance on Ultrasonic Backscatter from Blood. *J Acoust Soc Am* 75:1265-1272, 1984.
21. Bronez, M.A., K.K. Shung, and H. Heidary, and D. Hurwitz. Measurement of Ultrasound Velocity in Tissues Utilizing a Microcomputer-Based System. *IEEE Transactions on Biomedical Engineering* BME-32:723-726, 1985.
22. Fei, D.Y. and K.K. Shung. Ultrasonic Backscatter from Mammalian Tissues. *J. Acoust. Soc. Am.* 78: 871-876, 1985.
23. Shung, K.K.. Ultrasonic Characterization of Biological Tissues. *ASME J. of Biomechanical Engineering*, 107:309-314, 1985.
24. Shung, K.K., D.Y. Fei, and M.A. Bronez. Effects of Atherosclerotic Lesions on Ultrasonic Beam and CW Doppler Signals. *J. Clin. Ultrasound*, 13:11-18, 1985.
25. Yu, F.T.S., K.K. Shung, and X. Chen. A White-Light Pseudocolor Encoder for Diagnostic Imaging. *IEEE Trans. on Biomedical engineering*, BME-32:199-204, 1985.
26. Shung, K.K., D.Y. Fei and J.O. Ballard. Further Studies on Ultrasonic Properties of Blood Clots. *J. Clinical Ultrasound* 14:269-275, 1986.
27. Tarbell, J.M., J.P. Gunshinan, D.B. Geselowitz, G. Rosenberg, K.K. Shung and W.S. Pierce. Pulsed Ultrasonic Doppler Velocity Measurements Inside a Left Ventricular Assist Device. *ASME Journal of Biomechanical Eng.* 108:232-238, 1986.
28. Yuan, Y.W. and K.K. Shung. The Effect of Focusing on Ultrasonic Backscatter Measurements. *Ultrasonic Imaging* 8:121-130, 1986.
29. Shung, K.K. Ultrasonic Characterization of Blood, a chapter in CRC Press book *Ultrasonic characterization of Tissues*, edited by J Greenleaf, CRC Press, Baton Roca, FL, Vol II, 227-245, 1986.
30. Fei, D.Y., K.K. Shung, and T.M. Wilson. Ultrasonic Backscatter from Bovine Tissues: Variation with Pathology. *J. Acoustic Soc. Am.* 81:166-172, 1987.

31. Shung, K.K., and Y.W. Yuan. Measurement of Scattering Properties of Small or Tenuous Particles, in Multiple Scattering of waves in Random media and Random Rough Surfaces edited by VK Varadan and VV Varadan, Penn State Press, 653-662, 1987.
32. Shung, K.K. Recent Developments in Diagnostic Ultrasound, CRC Critical Reviews in Biomedical Engineering, 15:1-28, 1987.
33. Shung, K.K. General Engineering Principles in Diagnostic Ultrasound. IEEE Engineering in Medicine and Biology Society Magazine. 6:7-13, 1987.
34. Yuan, Y.W. and K.K. Shung. Ultrasonic Backscatter from Flowing Whole Blood I: Dependence on Shear Rate and Hematocrit. J. Acoustic Soc. Am. 84:52-58, 1988.
35. Yuan, Y.W. and K.K. Shung. Ultrasonic Backscatter from Flowing Whole Blood II: Dependence on Frequency and Fibrinogen. J. Acoust. Soc. Am., 84:1195-1200, 1988.
36. Yuan, Y.W. and K.K. Shung. Echogenicity of Flowing Whole Blood" Journal of Ultrasound in Medicine, 8:425-434, 1989.
37. Bleeder, H., and K.K. Shung. Ultrasonic Characterization of ALBUNEX - A New Contrast Agent" Journal of Acoustical Society of America 87:1792-1797, 1990.
38. Shung, K.K. Physical Principles of Ultrasonic Tissue Characterization. a chapter of a book "Noninvasive Techniques in Biology and Medicine" edited by S.E. Freeman, E. Fukushima, E.R. Greene, 205-217, San Francisco Press, San Francisco 1990.
39. Bleeker, H., K.K. Shung, and J.L. Barnart. On the Application of Ultrasound Contrast Agents for Assessing Cardiac Perfusion and Blood Flow. Journal of Ultrasound in Medicine 9:461-471, 1990.
40. Kuo, I.Y., B. Hete, and K.K. Shung. A Novel Method for Measuring Sound Velocity in Tissues. Journal of Acoustical Society of America 88:1679-1682, 1990.
41. Wu, J.Y. and K.K. Shung. Reflection Non-linear Acoustic Imaging. Journal of Acoustical Society of America 88: 2852-2858, 1990.
42. Mo, L.Y.L., R.S.C. Cobbold, M. Joy and K.K. Shung. Non-Newtonian Behavior of Whole Blood in a Large Diameter Tube. Biorheology 28: 421-427, 1991.
43. Shung, K.K., G. Cloutier and C. Lim. The Effects of Hematocrit, Shear Rate and Turbulence on Doppler Spectrum from Blood. IEEE Trans. on Biomedical



- Engineering 39: 462-469, 1992.
44. Shung, K.K. Chapter 1: Introduction, in Ultrasonic Scattering in Biological Tissues edited by K.K. Shung and G.A. Thieme, 2-17, CRC Press, Boca Raton, FL, 1993.
  45. Shung, K.K. and G.A. Thieme. Chapter 3: Biological Tissues as Ultrasonic Scattering Media, in Ultrasonic Scattering in Biological Tissues edited by K.K. Shung and G.A. Thieme, 53-74, CRC Press, Boca Raton, FL, 1993.
  46. Shung, K.K. Chapter 9: In Vitro Experimental Results on Ultrasonic Scattering in Biological Tissues, in Ultrasonic Scattering in Biological Tissues edited by K.K. Shung and G.A. Thieme, 291-312, CRC Press, Boca Raton, FL, 1993.
  47. J.Y. Wu and K.K. Shung. A Multi-frequency Transducer Assembly for Non-linear Ultrasonic Experiments. Journal of Acoustical Society of America 93: 2231-2234, 1993.
  48. B. Wilson, K.K. Shung, H. Levene and J.L. Barnhart. A feasibility study on quantitating myocardial perfusion with Albutex<sup>®</sup>, an ultrasonic contrast agent. Ultrasound in Medicine and Biology 19: 181-191, 1993.
  49. K.K. Shung, I.Y. Kuo and G. Cloutier. Ultrasonic scattering properties of blood. in Intravascular Ultrasound 1993 edited by J. Roelandt and N. Bom, 119-139, Kluwer Press, The Netherlands, 1993.
  50. B. Hete and K.K. Shung. Scattering of ultrasound from skeletal muscle tissue. IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control 40: 354-365, 1993.
  51. I.Y. Kuo and K.K. Shung. The effects of ultrasound frequency and erythrocyte size on the echogenicity of blood. Biomedical Engineering, Applications, Basis, Communication 5: 31-35, 1993.
  52. G. Cloutier and K.K. Shung. Cyclic variation of the amplitude of ultrasonic Doppler signals backscattered by polystyrene microspheres and porcine erythrocyte suspensions. IEEE Trans. Biomed Eng 40: 953-962, 1993.
  53. G. Cloutier, K.K. Shung and L.G. Durand. Experimental evaluation of intrinsic and nonstationary ultrasonic Doppler spectral broadening in steady and pulsatile flow loop models. IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control 40: 785-795, 1993.
  54. T. Kling, K.K. Shung and G.A. Thieme. Ultrasonic Dual-Frequency Subtraction Imaging. IEEE Trans. on Medical Imaging 12: 792-802, 1993.

55. G. Cloutier and K.K. Shung. Study of red cell aggregation in pulsatile flow from ultrasonic Doppler power measurements. *Biorheology* 30: 443-461, 1993.
56. I.Y. Kuo and K.K. Shung. High frequency ultrasonic backscatter from erythrocyte suspension. *IEEE Trans. Biomedical Engineering* 41: 29-34, 1994.
57. L.Y. L. Mo, I.Y. Kuo, K.K. Shung, L. Ceresne, and R.S.C. Cobbold. Ultrasonic scattering from blood with hematocrits up to 100%. *IEEE Trans. Biomedical Engineering* 41: 91-95, 1994.
58. K.K. Shung and I.Y. Kuo. Analysis of Ultrasonic Scattering in Blood via the Continuum Approach. *Ultrasound in Medicine and Biology* 20: 623-627, 1994.
59. J.M. Zhang, J. Rose and K.K. Shung. A computer model for simulation of ultrasonic scattering in biological tissues with high scatterer concentrations. *Ultrasound in Medicine and Biology* 20: 903-913, 1994.
60. K.K. Shung and R.R. Flenniken. Ultrasonic contrast blood flowmetry. *Ultrasound in Medicine and Biology* 21: 71-78, 1995.
61. B. Hete and K.K. Shung. A study of the relationship between mechanical and ultrasonic properties of dystrophic and normal skeletal muscle. *Ultrasound in Medicine and Biology* 21: 343-352, 1995.
62. L.M. Wang and K.K. Shung. Contrast medium assisted ultrasonic fluid flow measurements. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 42: 309-315, 1995.
63. S.J. Wu and K.K. Shung. Sensitivity measurements of ultrasonic Doppler instruments. *Biomedical Engineering: Applications, Basis and Communication*. 7: 588-592, 1995.
64. P.H. Chang, K.K. Shung, S.J. Wu and H. Levene. Second harmonic imaging and harmonic Doppler measurements. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 42: 1020-1027, 1995.
65. L.M. Wang and K.K. Shung. Two-bit correlation - an adaptive time delay estimation. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 43: 473-481, 1996.
66. S.H. Wang, P.H. Chang and K.K. Shung. Some considerations on the measurements of mean frequency shift and integrated backscatter following administration of Albuterol. *Ultrasound in Medicine and Biology* 22 : 441-451, 1996.

67. L.M. Wang and K.K. Shung. Adaptive pattern correlation for 2-D blood flow measurements. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 43: 881-887, 1996.
68. S.J. Wu and K.K. Shung. Cyclic variation of Doppler power from porcine whole blood under pulsatile flow. *Ultrasound in Medicine and Biology* 22: 883-894, 1996.
69. I. Zhang, K.K. Shung and D.A. Edwards. Hydrogels with enhanced mass transfer for transdermal drug delivery. *Journal of Pharmaceutical Sciences* 85: 1312-1316, 1996.
70. B. Schneider and K.K. Shung. Quantitative analysis of pulsed ultrasonic beam patterns using a Schlieren system. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 43: 1181-1186, 1996.
71. K.K. Shung and M. Zipparo. Ultrasonic transducers/arrays. *IEEE Engineering in Medicine and Biology Magazine* 15: 30, 1996.
72. P.H. Chang, K.K. Shung and H. Levene. Quantitative measurements of second harmonic Doppler using ultrasound contrast agents. *Ultrasound in Medicine and Biology* 22: 1205-1214, 1996.
73. K.K. Shung and G. Cloutier. Medical Diagnosis with Acoustics. in "Handbook of Acoustics" M.J. Crocker, editor, John Wiley, New York, 1739-1750, 1997.
74. S.H. Wang and K.K. Shung. An approach for measuring ultrasonic backscatter from biological tissues with focused transducers. *IEEE Transactions on Biomedical Engineering* 44: 549-554, 1997.
75. M.J. Zipparo, K.K. Shung and T. Shrout. Piezoceramics for high frequency (50-100 MHz) single element imaging transducers. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 44: 1038-1048, 1997.
76. C.Y. Wang and K.K. Shung. Variation of ultrasonic backscattering from skeletal muscle during passive stretching. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 45: 504-510, 1998.
77. S.J. Wu, K.K. Shung and J.G. Brasseur. In situ measurement of Doppler power vs. Flow turbulence intensity in red cell suspensions. *Ultrasound in Medicine and Biology* 24: 1009-1021, 1998.
78. S.J. Wu and K.K. Shung. An in vitro study of the effects of Doppler angle, fibrinogen and hematocrit on ultrasonic Doppler power from blood. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 46: 197-204, 1999.

79. P. H. Chang and K.K. Shung. Interaction of ultrasound and gaseous contrast agents. Chapter 26 in "Trends in Contrast Media" edited by H.S. Thomsen, R.N. Mueller, R.F. Mattery, Springer-Verlag, Berlin, Germany, pp311-320, 1999.
80. T.X. Missaridis and K.K. Shung. The effect of hemodynamics, vessel wall elasticity and hematocrit on the ultrasonic Doppler power - an in-vitro study. *Ultrasound in Medicine and Biology* 25: 549-559, 1999.
81. S.H. Wang and K.K. Shung. Spatial variation of ultrasonic backscatter from flowing whole blood. *Journal of Medical Ultrasound* 7: 92-100, 1999.
82. E.L. Madsen, K.K. Shung, et. al. Interlaboratory comparison of ultrasonic backscatter, attenuation and speed measurements. *Journal of Ultrasound in Medicine* 18: 615-631, 1999.
83. K.K. Shung. Chapter 15: Ultrasound. A chapter in "Introduction to Biomedical Engineering" edited by J.D. Enderle et al, pp745-782, Academic Press, San Diego, CA, 1999.
84. Y.H. Lin and K.K. Shung. Ultrasonic backscattering from porcine whole blood of varying hematocrit and shear rate under pulsatile flow. *Ultrasound in Medicine and Biology* 25: 1151-1158, 1999.
85. D.M. Kawamura, K.E. Boyce, K.K. Shung, and S.S. Calton. Ultrasound physics and instrumentation in clinical practice and application: an ARDMS task survey. *Journal of Diagnostic Medical Sonography* 16:1-13, 2000.
86. T. Ritter, K.K. Shung, X. Geng, P.D. Lopath, S.E. Park, and T.R. Shrout. Single crystal PZN/PT polymer composites for ultrasound transducer applications. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 47: 792-800, 2000.
87. T. Ritter, K.K. Shung, W. Cao and T.R. Shrout. Electromechanical properties of thin strip piezoelectric vibrators at high frequency. *Journal of Applied Physics* 88: 394-397, 2000.
88. S. Maruvada, K.K. Shung and S.H. Wang. High frequency ultrasonic backscatter and attenuation measurements between 10 and 30 MHz. *Ultrasound in Medicine and Biology* 26: 1043-1049, 2000.
89. H. Wang, T. Ritter, W. Cao and K.K. Shung. High frequency properties of passive materials for ultrasonic transducers. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 48: 78-84, 2001.

89. S.H. Wang and K.K. Shung. In vivo measurement of ultrasonic backscattering from blood. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 48: 425-431, 2001.
90. P.J. Cao, D. Paeng, K.K. Shung. The black hole phenomenon in ultrasonic backscattering measurements under pulsatile flow with porcine whole blood in a rigid tube. *Biorheology* 38: 15-26, 2001.
91. D. Paeng, P.J. Cao, K.K. Shung. Doppler power variation from porcine blood and polystyrene microspheres under steady and pulsatile flow in a mock flow loop. *Ultrasound in Medicine and Biology* 27: 1245-1254, 2001.
92. T.R. Ritter, T.R. ShROUT, R. Tutwiler, and K.K. Shung. A 30 MHz piezo-composite ultrasound array for medical imaging applications. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 48: 213-230, 2002.
93. K. Snook, J. Zhao, K.K. Shung et al. Design, fabrication and testing of high frequency single element transducers incorporating different materials. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 48: 169-176, 2002.
94. S. Maruvada, S.H. Wang and K.K. Shung. High frequency attenuation and backscatter measurements of bovine red cell suspensions between 30 and 90 MHz. *Ultrasound in Medicine and Biology* 28: 1081-1088, 2002.
95. K.K. Shung. Principles of multidimensional arrays. *European Journal of Echocardiography* 3: 149-153, 2002.
96. E. Maione, K.K. Shung, R.J. Meyer, J.W. Hughes, R.E. Newnham, and N.B. Smith. Transducer design for a portable ultrasound enhanced transdermal drug delivery system. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control* 49: 1430-1436, 2002.
97. K.K. Shung. Biomedical Ultrasonics. 9<sup>th</sup> edition of McGraw Hill Encyclopedia of Science and Technology, 79-83, 2002.
98. N.B. Smith, S. Lee, E. Maione, R.B. Roy, S. McElligott, and K.K. Shung "Ultrasound mediated transdermal in vivo transport of insulin with low profile cymbal transducers" *Ultrasound in Med. and Biol.* 29: 311-317, 2003.
99. K.K. Shung and D.G. Paeng "Ultrasound: an unexplored tool for blood flow visualization and hemodynamic measurements" *Jpn. J. Appl. Phys.* 42: 2901-2908, 2003.

100. D.G. Paeng and K.K. Shung "Cyclic and radial variation of the Doppler power from porcine whole blood" *IEEE Trans Ultras. Ferroelectrics and Frequency Control* 50: 614-622, 2003.
101. N.B. Smith, S. Lee and K.K. Shung "Ultrasound mediated transdermal in vivo transport of insulin with low-profile cymbal arrays" *Ultrasound in Med. and Biol.* 29: 1205-1210, 2003.
102. J. Cannata, T. Ritter, R. Silverman, K. Shung. Design of Efficient, Broadband Single Element (20 - 80 MHz) Ultrasonic Transducers for Medical Imaging Applications. *IEEE Trans Ultras. Ferroelect. Freq. Cont.* 50: 1548-1557, 2003.
103. K.K. Shung. Recent advances in ultrasonic imaging. A chapter in "Frontiers in Biomedical Engineering" edited by N. Hwang and S. Woo, 233-246, Kluwer, New York, 2003.
104. D.G. Paeng, R. Chaio and K.K. Shung "Echogenicity Variations from Porcine Blood I: The Bright Collapsing Ring Under Pulsatile Flow" *Ultrasound in Med. and Biol.* 30: 45-55, 2004.
105. B. Lei, L. Chao, D. Zhang, C. Zhou, Q.F. Zhou, K.K. Shung, C. Zhou. Nanowire transistors with ferroelectric gate dielectrics: enhanced performance and memory effects. *Applied Physics Letters* 84: 4553-4555, 2004.
106. M. Robert, G. Molingou, K. Snook, J. Cannata and K.K. Shung "Fabrication of focused P(VDF-TrFE) copolymer 40 -50 MHz ultrasonic transducers on curved Surfaces" *Journal of Applied Physics* 96: 252-256, 2004.
107. D.G. Paeng, R. Chaio and K.K. Shung "Echogenicity Variations from Porcine Blood II: The "Bright Ring" Under Oscillatory Flow" *Ultrasound in Med. and Biol.* 30: 815-826, 2004.
108. R. H. Silverman, A. Chabi, M. J. Rondeau, K. K. Shung, J. Cannata, H. Lincoff, D. J. Coleman, "High Resolution Ultrasonic Imaging of the Posterior Segment" *Ophthalmology* 111: 1344-1351, 2004.
109. K.K. Shung, "Ultrasound and tissue interaction" A chapter in *Encyclopedia of Biomaterials and Biomedical Engineering* edited by G.E. Wnek and G.L. Bowlin, 1706-1714, Marcel Dekker, New York, 2004.
110. D.K. Paeng, P.J. Cao, M. Choi, and K.K. Shung. Ultrasonic backscatter response to blood flow disturbance by a severe eccentric stenosis. *Key Engineering Materials* 272: 2036-2041, 2004.
111. H. Wang, W. Cao, Q. Zhou, K. K. Shung, and Y.H. Huang. Silicon Oxide Colloidal/Polymer Nanocomposite Films. *Applied Physics Letters* 85: 5998-6000, 2004.
112. G.H. Feng, E.S. Kim, C.S. Sharp, Q.F. Zhou, K.K. Shung. Fabrication of MEMS ZnO Dome-Shaped-diaphragm transducers for high frequency ultrasonic imaging. *Journal of Micromechanics and Microengineering* 15: 586-590, 2005.

113. Q.F. Zhou, J. Cannata, H.K. Guo, K.K. Shung "Half thickness inversion layer high frequency ultrasonic transducers using LiNbO<sub>3</sub> single crystal" IEEE Trans Ultra. Ferroelect. Freq. Cont. 52: 127-133, 2005.
114. C. Huang, V.Z. Marmarelis, Q. Zhou, and K.K. Shung "An Analytical Model of Multi-Layer Ultrasonic Transducers with an Inversion Layer" IEEE Trans Ultra. Ferroelect. Freq. Cont. 52: 469-479, 2005.
115. Q.F. Zhou, J.M. Cannata, D. J. Van Tol, S. Tadigadapa, W.J. Hughes, K.K. Shung and S. Mckinstry. Fabrication and Characterization of micromachined tonpiliz high frequency transducers derived by PZT thick films. IEEE Trans Ultra. Ferroelect. Freq. Cont. 52: 350-357, 2005.
116. H.K. Guo, J.M. Cannata and K.K. Shung. Dielectric relaxation behavior of BaTiO<sub>3</sub>/SrTiO<sub>3</sub> composites. Journal of Material Science Letters 40: 1509-1511, 2005.
117. J. Lee and K.K. Shung. A theoretical study on the feasibility of the development of acoustic tweezer: ray acoustic approach. Journal of Acoustic Society of America 117: 3273-3280, 2005.
118. S.J. Wu, I. Kuo, and K.K. Shung. Boundary element simulation of backscattering properties for red blood cells with high frequency ultrasonic transducers. Ultrasonics 43: 145-151, 2005.
119. Q.F. Zhou, K.K. Shung, Q.Q. Zhang and F.T. Djuth. Structure and electrical properties of sol-gel-derived (001) oriented Pb[Yb<sub>1/2</sub>Nb<sub>1/2</sub>]O<sub>3</sub> – PbTiO<sub>3</sub> thin films grown on LaNbO<sub>3</sub>/Si(001) substrates. Journal of Applied Physics 97: 104103-1 – 104103-4, 2005.
120. K.A. Wear, E.L. Madsen, W.D. O'Brien, K.K. Shung, T.A. Wilson and J.R. Yuan. Interlaboratory comparison of ultrasonic backscatter coefficient measurements from 2 to 9 MHz. J Ultrasound Med 24: 1235-1250, 2005.
121. B. Huang and K.K. Shung. Characterization of Very High Frequency Transducers with Wire Targets and Hydrophone. IEEE Trans Ultra. Ferroelect. Freq. Cont. 52: 1068-1072, 2005.
122. H.K. Guo, J.M. Cannata, Q.F. Zhou, and K.K. Shung. Design and Fabrication of broadband ultrasonic transducers using partial composites. IEEE Trans Ultra. Ferroelect. Freq. Cont. 52: 2096-2102, 2005.
123. J.M. Cannata, J.A. Williams, Q.F. Zhou, T.A. Ritter, and K.K. Shung. Development of a 35 MHz piezo-composite ultrasound array for medical imaging. IEEE Trans Ultra. Ferroelect. Freq. Cont. 52: 224-236, 2005.
124. K.A. Snook, T.R. Shrout, C.H. Hu and K.K. Shung. Development of a high frequency annular array imaging system I: annular array design. IEEE Trans Ultra. Ferroelect. Freq. Cont. 53: 300-308, 2006.

125. C.H. Hu, K.A. Snook and K.K. Shung. Development of a high frequency annular array imaging system II: digital beamformer design. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 53: 309-316, 2006.
126. C.H. Hu, X.C. Chen, J.M. Cannata, J.T. Yen and K.K. Shung. Development of real-time high frequency ultrasound digital beamformer with the 30-35 MHz linear array transducers. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 53: 317-323, 2006.
127. E.J. Gottlieb, J.M. Cannata, C.H. Hu, and K.K. Shung. Development of a high frequency (>50 MHz) copolymer annular array ultrasound transducer. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 53: 1037-1045, 2006.
128. J.W. Lee and K.K. Shung. Radiation force exerted on arbitrarily located sphere by acoustic tweezer. *Journal of the Acoustical Society of America* 120: 1084-1094, 2006.
129. J. W. Lee and K.K. Shung. Effect of attenuation on the feasibility of acoustic tweezer. *Ultrasound in Medicine and Biology* 32: 1575-1583, 2006.
130. R.H. Silverman, J. Cannata, K.K. Shung, O. Gal, M. Patel, H.O. Lloyd, E.J. Feleppa, D.J. Coleman. 75 MHz ultrasound biomicroscopy of anterior segment of the eye. *Ultrasonic Imaging* 28: 1-17, 2006.
131. Q.F. Zhou, J. M. Cannata, and K.K. Shung. Design and modeling of inversion layer ultrasonic transducers using LiNbO<sub>3</sub> single crystal. *Ultrasonics* 44: e607-e611, 2006.
132. Q.Q. Zhang, F.T. Djuth, Q.F. Zhou, C.H. Hu, J.H. Cha, and K.K. Shung. High frequency broadband PZT thick film ultrasonic transducers for medical imaging applications. *Ultrasonics* 44: e711-e715, 2006.
133. C.H. Hu, R. Liu, Q. Zhou, J.T. Yen and K.K. Shung. Coded excitation using biphas-coded pulse with mismatched filters for high frequency ultrasound imaging. *Ultrasonics* 44:330-336, 2006.
134. X. Xu, J. Yen and K.K. Shung. A low-cost high frequency bipolar pulse generator for high frequency applications. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 54: 443-447, 2007.
135. Q.F. Zhou, X. Xu, E. Gottlieb, L. Sun, J. Cannata, H. Ameri, M. Humayun, P.D. Han, K.K. Shung. PMN-PT Single crystal high frequency ultrasonic needle transducers for pulsed wave Doppler application. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 54: 668-675, 2007.
136. R. Zhang, W. Cao, Q. Zhou, J.H. Cha, K.K. Shung and Y. Huang. Acoustic properties of alumina colloidal/polymer nano-composite on silicon. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 54: 467-669, 2007.



137. Q.F. Zhou, C. Sharp, J.M. Cannata, K.K. Shung, G.H. Feng, and E.S. Kim and. Self-focused high frequency ultrasonic transducers based on ZnO piezoelectric films. *Applied Physics Letters* 90: 113502-1-3, 2007.
138. R.J. Zemp, R. Bitton, M.L Li, K.K. Shung, G. Stoica and L.V. Wang. Photoacoustic imaging of the microvasculature with a high frequency ultrasound array transducer. *J. Biomed. Optics* 12: 10501-1 – 10501-3, 2007.
139. Q.F. Zhou, K.K. Shung and Y. Huang. Improved electrical properties of sol-gel derived lead zirconate titanate thick films for ultrasonic transducer applications. *J. Mater. Sci.* 42: 4480-4484, 2007.
140. L. Sun, C. Feng, J.M. Cannata, J.A. Johnson, J.T. Yen and K. K. Shung. A high frame rate high frequency ultrasonic system for cardiac imaging in small animals. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 54: 1648-1655, 2007.
141. ***C.C. Huang, L. Sun, S.H. Daily, S.H. Wang and K.K. Shung. High Frequency ultrasonic characterization of human vocal cord tissue. Journal of the Acoustical Society of America, 122: 1827-1832, 2007.***
142. ***K.K. Shung, J. Cannata and Q.F. Zhou. Piezoelectric Materials for High Frequency Medical Imaging Applications: A Review. Journal of Electroceramics 19: 139-145, 2007.***
143. J.H. Chang, J.T. Yen and K.K. Shung. A novel envelope detector for high frame rate high frequency ultrasound imaging. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 54: 1792-1801, 2007.
144. C.C. Huang, H. Ameri, C. DeBoer, A. Rowley, X. Xu, L. Sun, M. S. Humayun, and K.K. Shung. Evaluation of lens hardness in cataract surgery using high frequency ultrasonic parameters in vitro. *Ultrasound in Medicine and Biology* 33: 1609-1616, 2007.
145. B. H. Tsui, C.C. Huang, C.C. Cheng and K.K. Shung. Feasibility study of using high frequency ultrasonic Nakagami imaging for characterizing the cataract lens in vitro. *Physics in Medicine and Biology* 52: 6413-6425, 2007.
146. X.K. Li, J. Pemberton, R. Chia, D.N. Stephens, M. O'Donnell, A. Mahajan, S. Balaji, K. Thomenius, A. Dentinger, R.I. Lowe, M. Asharf, K.K. Shung, K. Shivkumar and D.J. Sahn. Development of an EP enabled intracardiac ultrasound catheter integrated with NavX 3D electrofield mapping for guiding cardiac EP interventions: experimental studies. *Journal of Ultrasound in Medicine* 26: 1565-1574, 2007.
147. C. C. Huang, Q. Zhou, H. Ameri, D. Wu, L. Sun, S.H. Wang, M.S. Humayun and K.K. Shung. Determining the acoustic properties of the lens using a high-frequency ultrasonic needle transducer *Ultrasound Med. Biol.* 33: 1971-1977, 2007.

148. L. Sun, C.L. Lien and K.K. Shung. In vivo cardiac imaging of adult zebrafish using high frequency ultrasound (45-75 MHz). *Ultrasound in Medicine and Biology* 34: 31-39, 2008.
149. K.H Nam, D.G. Paeng, M. J. Choi and K. K. Shung. Ultrasonic observation of blood disturbance in a stenosed tube: Effects of flow acceleration and turbulence downstream. *Ultrasound in Medicine and Biology* 34: 114-122, 2008.
150. D. Stephens, R. Liu, Z. Zhao, J.M. Cannata, K.K. Shung, R. Chia, K. Thomenius, M. O'Donnell, and D. Sahn. The acoustic lens design and in vivo use of a multifunctional catheter combining intracardiac ultrasonic imaging and electrophysiological sensing. *IEEE Trans Ultra. Ferroelect. Freq. Cont.*55: 602-618, 2008 (PMC2756724).
151. X. Xu, L. Sun, J.M. Cannata, J.T. Yen and K.K. Shung. High frequency ultrasonic Doppler system for biomedical applications with a 30 MHz linear array. *Ultrasound in Medicine and Biology* 34: 638-646, 2008.
152. J.M. Cannata, Q.F. Zhou, J. Williams, E.S. Kim and K.K. Shung. Self-focused ZnO transducers for ultrasonic microscopy. *Journal of Applied Physics* 103: 084109, 1-4, 2008.
153. Q.F. Zhou, D. Wu, J.M. Cannata, J. Williams, C.H. Hu, X. Xu, K.K. Shung. Design and fabrication of PZN-7%PT single crystal high frequency angled needle ultrasound transducers. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 55: 1394-1399, 2008 (PMC2717903).
154. R.J. Zemp, L. Song, R. Bitton, K.K. Shung and L.V. Wang. Real-time photoacoustic in vivo microscopy with a 30 MHz ultrasound array transducer. *Optics Express* 16: 7915-7928, 2008 (PMC2644743).
155. J.H. Woo, B.W. Hong, C.H. Hu, K.K. Shung, C.C. Kuo, P. Slomka. Non-rigid Ultrasound Image Registration Based on Intensity and Local Phase Information. *J. of Signal Processing Systems* published on line, DOI 10.1007/s11265-008-0218-2, 2008.
156. B.P. Zhu, D.W. Wu, Q.F. Zhou, J. Shi, K.K. Shung. Lead zirconate titanate thick film with enhanced electrical properties for high frequency ultrasonic transducer applications. *Applied Physics Letters* 93: 012905,1-3, 2008.
157. J.H. Chang, J.T. Yen, and K.K. Shung. High speed digital scan converter for high frequency ultrasound sector scanning. *Ultrasonics* 48: 444-452, 2008.
158. C.H. Hu, Q. Zhou, and K.K. Shung. Design and implementation of an FPGA-based high frequency ultrasound pulsed wave Doppler system. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 55: 2109-2111, 2008 (NIHMS130179).
159. K.K. Shung, J.M. Cannata, and Q.F. Zhou. High frequency transducers and arrays. A chapter in "Piezoelectric and Acoustic Materials for Transducer Applications" edited by

- A. Safari and E.K. Akdogan, 431-451, Springer, New York, NY 2008.
160. R.J. Zemp, L. Song, R. Bitton, K.K. Shung, and L.V. Wang. Real-time photoacoustic microscopy of murine cardiovascular dynamics. *Optics Express* 16: 18551-18556, 2008 (PMC2717902).
  161. K.H. Kim, J.M Cannata, R. Liu, J.H. Chang, R.H. Silverman, and K.K. Shung. 20MHz/40 MHz dual element transducers for high frequency harmonic imaging. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 55: 2683-2691, 2008 (PMC2717901).
  162. S. T. Lau, H. L.W. Chan, L. Y. Shao, H. Y. Tam, C. H. Hu, Q. Zhou, K. K. Shung. Characterization of a 40 MHz Focused Transducer with a Fiber Grating Laser Hydrophone. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 55: 2714-2718 2008 (PMC2717904).
  163. L. Sun, X. Xu, W.D. Richard, C. Feng, J.M. Cannata, J.A. Johnson, and K. K. Shung. A high frame rate duplex ultrasound system for in vivo cardiovascular research in mice. *IEEE Trans. Biomedical Engineering* 55: 2039-2049, 2008.
  164. J. Zhu, W.W. Cao, B. Jiang, D.S. Zhang, Q. F. Zhou and K. K.Shung, "Nano-structured TiO<sub>2</sub> film fabricated at room temperature and its acoustic properties" *J. Phys. D, Applied Physics* 41: 162001, 2008 (PMC2722077).
  165. Q.F. Zhou, K.K. Shung, Q.Q. Zhang and F.T. Djuth. Temperature dependence of oriented growth of Pb[Yb<sub>1/2</sub>Nb<sub>1/2</sub>]O<sub>3</sub>-PbTiO<sub>3</sub> thin films deposited on LNO/Si substrates. *Thin Solid Films* 517, 695-698, 2008.
  166. L. Song, K. Maslov, R. Bitton, K. K. Shung, and L. V. Wang. Fast 3-D dark-field reflection- mode photoacoustic microscopy *in vivo* with a 30-MHz ultrasound linear array. *Journal of Biomedical Optics* 13, 054028, 2008.
  167. Q. Zhou, J.H. Cha, Y. Huang, R. Zhang, W. Cao, K.K. Shung. Alumina/Epoxy nanocomposite matching layers for high frequency ultrasound transducer applications. *IEEE Trans. Ultra. Ferroelect. Freq. Cont.* 56: 213-219, 2009 (NIHMS130185).
  168. F. Kong, Y.C. Chen, H.O. Loyld, R. Silverman, H.H. Kim, J.M. Cannata and K.K. Shung. High resolution photoacoustic imaging with focused laser and ultrasonic beams. *Appl. Physics Let.* 94: 33902,1-3, 2009 (PMC2682755).
  169. D. N. Stephens, M. O'Donnell, K. Thomenius, A. Dentinger, D. Wildes, P. Chen, K. K. Shung, J. Cannata, P. Khuri-Yakub, O. Oralkan, A. Mahajan, K. Shivkumar, D. J. Sahn . Experimental Studies with a 9 French Forward-Looking Intracardiac Imaging and Ablation Catheter. *Journal of Ultrasound in Medicine* 28: 207-215, 2009 (NIHMS198024).
  170. B.P. Zhu, D.D. Li, Q.F. Zhou, J. Shi, and K.K. Shung. PZT thick films on LaNiO<sub>3</sub> beffered stainless steel foils for flexible device applications. *Journal of Physics D: Applied Physics*

- 42: 025504, 1-4, 2009 (NIHMS129997).
171. D.W. Wu, R.M. Chen, Q.F. Zhou, K.K. Shung, D.M. Lin and H.L.W. Chan. Lead-free KNLNT piezoelectric ceramic for high frequency ultrasonic transducer application. *Ultrasonics* 49: 395-398, 2009 (PMC2867045).
  172. D.G. Paeng, J.H. Chang, R. Chen, K. K. Shung and M. Humayun. Feasibility of rotational scan ultrasound imaging by an angled high frequency transducer for posterior section of the eye. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 56: 676-680, 2009 (NIHMS130194).
  173. B. Zhu, Q.F. Zhou, J. Shi, K.K. Shung, S. Irisawa, and S. Takeuchi. Self-separated PZT thick films for high frequency ultrasound transducer applications. *Applied Physics letters* 94: 10291 1-3, 2009 (PMC2682757).
  174. D.G. Paeng, K. H. Nam, M. J. Choi, and K. K. Shung. Three dimensional reconstruction of "BRIGHT RING" echogenicity from porcine blood upstream in a stenosed tube. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 56: 880-885, 2009.
  175. P. Sun, Y. Zhang F. Yu, E. Parks, A. Lyman, C. Wu, C.-H Hu, Q. Zhou, K.K. Shung, C.-L. Lien, T. K. Hsiai. Electrocardiograms to Study Post-Ventricular Amputation of Zebrafish Heart. *Annals of Biomedical Engineering* 37: 890-901, 2009.
  176. K.K. Shung. High frequency ultrasonic imaging. *Journal of Medical Ultrasound* 17: 25-30, 2009 (PMC2863319).
  177. J.M. Yang, K. Maslov, H.C. Yang, Q.F. Zhou, K.K. Shung and L.V. Wang. Photoacoustic endoscopy. *Optic Letters* 34: 1591-1593, 2009 (PMC2738934).
  178. S. T. Lau, H. Li, K. S. Wong, Q. F. Zhou, D. Zhou, Y. C. Li, H. S. Luo, K. K. Shung and J.Y. Dai. Multiple matching schemes for broad-band PMN-PT single crystal phased-array transducer. *Journal of Applied Physics* 105: 094908 1-3, 2009 (PMC2719468).
  179. Y. Sun, J. Park, D.N. Stephens, J.A. Jo, L. Sun, J.M. Cannata, G. Sarafeem, K.K. Shung and L. Marcu. Development of a dual-mode diagnostic system combining time-resolved fluorescence spectroscopy and ultrasound backscatter microscopy. *Review of Scientific Instruments* 80: 065104 1-7, 2009 (PMC2736572).
  180. J. H. Chang, L. Sun, J. T. Yen, and K. K. Shung. High speed back-end processing system for high frequency B-mode imaging. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 56: 1490-1497, 2009 (PMC2717899).
  181. G.S. Chen, J. Cannata, R. Liu, H. Chang, and K.K. Shung. Design and Fabrication of high intensity focused ultrasound phased array for liver tumor therapy. *Journal of Biomedical Engineering: Applications, Basis and Communications* 21:1-6, 2009.

182. R. Bitton, R. Kemp, J. Yen, K.K. Shung, and L.V. Wang. A 3D High Frequency Array Based Photoacoustic Microscopy System for In Vivo Micro-Vascular Imaging. *IEEE Transactions on Medical Imaging* 28: 1190-1197, 2009 (PMC2757099).
183. J.W. Lee, H.H. Kim, C.Y. Lee and K.K. Shung. Single beam acoustic trapping. *Applied Physics Letters* 95: 073701 1-3, 2009 (PMC2755305).
184. ***J.S. Jeong, J. H. Chang, and K. K. Shung. Ultrasound Transducer and System for Real-Time Simultaneous Therapy and Diagnosis for Noninvasive Surgery of Prostate Tissue. IEEE Trans Ultra. Ferroelect. Freq. Cont. 56: 1913-1922, 2009 (PMC2760052).***
185. L. Song, C. Kim, K. Maslov, K.K. Shung and L.V. Wang. High speed dynamic 3D photoacoustic imaging of sentinel lymph node in a moraine model using an ultrasound array. *Medical Physics* 36: 3724-3729, 2009 (PMC2724177).
186. J. Peng, S.T. Lau, C. Shao, Y.J. Dai, H. Chen, H.S. Luo, B.P. Zhu, Q.F. Zhou and K.K. Shung. PMN-PT single crystal thick films on silicone substrate for high frequency micromachined ultrasonic transducers. *Applied Physics A: Material Science and Processing*. 9:5381 1-5, 2009. (PMC2954502)
187. C.C. Huang, R. Chen, Q.F. Zhou, M. Humayun and K.K. Shung. Measurement of ultrasonic attenuation for evaluating the hardness of a cataract lens by a high frequency ultrasonic needle transducer. *Physics in Medicine and Biology* 54: 5981-5994, 2009. (PMC28443554).
188. ***D. Wu, Q.F. Zhou, X. Geng, C. Liu, F. Djuth, and K.K. Shung. Very high frequency (>100 MHz) kerfless PZT linear arrays. IEEE Trans Ultra. Ferroelect. Freq. Cont. 25: 2304-2310, 2009. (PMC2850572)***
189. ***P. Sun, Q. F. Zhou, B. P. Zhu, D. Wu, C. H. Hu, J. M. Cannata, J. Tian, P. D. Han , G. Wang and K. K. Shung. Design and fabrication of PIN-PMN-PT Single Crystal High-Frequency Ultrasound Transducers. IEEE Trans Ultra. Ferroelect. Freq. Cont. 56: 2760-2763, 2009. (PMC2849290).***
190. D. Wu, Q. Zhou, K.K. Shung, S.N. Bharadwaja, D.S. Zhang, H. Zheng. Dielectric and piezoelectric properties of PZT composite thick films with variable solution to power ratios. *J Am Ceramic Soc* 92: 1276-1279, 2009. (PMC2850103)
191. J.H. Chang, H.H. Kim, J.W. Lee and K.K. Shung. Frequency compounded imaging with a high frequency dual element transducer. *Ultrasonics* 50: 453-457, 2010. (PMC4118472).
192. J.W. Lee, H.H. Kim, A. Lee, C.Y. Lee and K.K. Shung. Transverse acoustic trapping with a highly focused Gaussian ultrasound beam. *Ultrasound in Medicine and Biology* 36: 350-355, 2010. (PMC2815109).

193. N. Matsuoka, D.G. Paeng, R. chen, H. Ameri, W. Abdallah, Q.F. Zhou, A. Fawzi, K.K. Shung, and M. Humayun. Ultrasound Doppler measurements of blood flow velocity of rabbit retinal vessels using a 45 MHz needle transducer. *Graefes Arch Clin Exp Ophthalmol* DOI 10.1007/s00417-009-1298-9, 2010. (PMC2847001)
194. J. Yin, H.C. Yang, X. Li, J. Zhang, Q.F. Zhou, C.H. Hu, K. K. Shung and Z.P. Zhang. Integrated intravascular optical coherent tomography ultrasound system. *Journal of Biomedical Optics*. 15: 010512-1-3, 2010 (NIHMSID# 197827).
195. ***S. Jiao, M. Jiang, J. Hu, A. Fawzi, Q.F. Zhou, K.K. Shung, C.A. Puliafito, H.F. Zhang. Photoacoustic ophthalmoscopy for in vivo retinal imaging. Optics Express 18: 3967-3972, 2010 (PMC2864517).***
196. J. Wang, T. Liu, S. Jiao, R. Chen, Q. Zhou, K. K. Shung, L. V. Wang, and H. F. Zhang. Saturation effect in functional photoacoustic imaging. *Journal of Biomedical Optics* 15: 021317-1-5, 2010 (NIHMSID#197905).
197. J.S. Jeong, J.M. Cannata, K.K. Shung. Adaptive HIFU noise cancellation for simultaneous therapy and imaging using an integrated HIFU/imaging transducer. *Physics in Medicine and Biology* 55: 1889-1902, 2010 (PMC2864522) .
198. R. Silverman, F. Kong, Y.C. Chin, H.O. Lloyd, H. Kim. J.M. Cannata, K.K. Shung and D.J. Coleman. Photoacoustic imaging of ocular tissues. *Ultrasound in Medicine and Biology* 36: 733-742, 2010 (NIHMSID#194924).
199. L. Zhang, X. Xu, C. Hu, L. Sun, J.T. Yen, J.M. Cannata and K.K. Shung. A high-frequency high frame rate duplex ultrasound linear array imaging system for small animal imaging. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 57: 1548-1557, 2010 (PMC2908919).
200. D.G. Paeng, K.H. Nam, and K.K. Shung. Cyclic radial variation of the echogenicity of blood in human carotid arteries observed by harmonic imaging. *Ultrasound in Medicine and Biology* 36: 1181-1124, 2010.
201. D.T. Raphael, J.H. Chang, Y.P. Zhang, D. Kudija, T.C. Chen and K.K. Shung. A-mode ultrasound guidance for pedicle screw advancement in ovine vertebral bodies. *Spine* 10: 422-433, 2010.

202. **Q.F. Zhou, D. Wu, C.G. Liu, B.P. Zhu, F. Djuth and K. K. Shung** *Micro-machined High Frequency (80 MHz) PZT Thick Film Linear Arrays. IEEE Trans. Ultra. Ferroelect. Freq. Cont. 57: 2213-2220, 2010 (PMC2966894).*
203. **X. Li, J. Yin, C.H. Hu, Q.F. Zhou, K.K. Shung and Z.P. Chen.** *High resolution coregistered intravascular imaging with integrated ultrasound and optical coherence tomography probe. Applied Physics Letters, 97: 133702-1-3, 2010 (PMC2962660).*
204. J.W. Lee, C.Y. Lee and K.K. Shung. Calibration of sound forces in acoustic traps. IEEE Trans. Ultra. Ferroelect. Freq. Cont. 57: 2305-2310, 2010 (PMC3056275).
205. L. Song, K. Maslov, K. K. Shung, and L. V. Wang, "Ultrasound-array-based real-time photoacoustic microscopy of human pulsatile dynamics *in vivo*," Journal of Biomedical Optics 15, 021303, 2010 (PMC2850586).
206. H.C. Yang, J. Yin, C.H. Hu, Q.F. Zhou, J. Zhang, J.M. Cannata, Z.P. Chen, K.K. Shung. A dual-modality probe utilizing intravascular ultrasound and optical coherence tomography for intravascular imaging. IEEE Trans Ultra. Ferroelect. Freq. Cont. 57: 2839-2843, 2010 (PMC305978).
207. J. S. Jeong , J. M. Cannata, and K. K. Shung. Dual-Focus therapeutic ultrasound transducer for production of broad tissue lesions. Ultrasound in Medicine and Biology 36: 1836-1848, 2010 (PMC3056278).
208. D.K. Yao, K. Maslov, K.K. Shung, Q.F. Zhou, and L.V. Wang. In vivo label free photoacoustic microscopy of cell nuclei by excitation of DNA and RNA. Optics Letters 35: 4139-4141, 2010 (NIHMSID258720).
209. B.P. Zhu, J. Han, J. Shi, K. K. Shung, Y. Huang, M. Kosec, and Q.F. Zhou. Lift-Off PMN-PT Thick Film for High-Frequency Ultrasonic Microscopy. J. Am. Ceram. Soc., 93: 2929-2931, 2010. (NIHMS 213686)
210. P. Sun, G.F. Wang, D. Wu, B.P. Zhu, C.H. Hu, C.G. Liu, F. Djuth, Q.F. Zhou, and K.K. Shung. High Frequency PMN-PT 1-3 Composite Transducer for Ultrasonic Imaging Application. Ferroelectrics, 408: 120 — 128, 2010. (PMC3159894)
211. Q.F. Zhou, S. Lau, D.W. Wu, and K.K. Shung. Piezoelectric films for high frequency ultrasonic transducers in biomedical applications. Progress in Material Science 56: 139-174, 2011 (PMC 3123890).
212. J. H. Chang, D. T. Raphael, Y. P. Zhang, and K. K. Shung. Measurement of Correlation between Radiodensity and Ultrasound Echo Response of Ovine Vertebral Bodies. Ultrasonics, 50: 253-257, 2011.
213. H.Z. Chabok, J.M. Cannata, H.H. Kim, J. Williams, J.H. Park, K.K. Shung. A High

- Frequency Annular Array Transducer using a Interdigital Bonded 1-3 Composite. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 206-214, 2011 (PMC3056280).
214. S.T. Lau, X. Li, H.F. Ji, W. Ren, Q. F. Zhou, K.K. Shung. KNN/BNT composite lead free films for medical transducer applications. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 249-254, 2011 (PMC3056072).
  215. D. Zhou, K.F. Cheung, S. Lau, Q. Zhou, K.K. Shung, H. Luo, J.Y. Dai and H. Helen. Fabrication and performance of endoscopic ultrasound radial arrays based on PMN-PT single crystal/Epoxy 1-3 composite. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58:477-484, 2011 (PMC3056406).
  216. P.H. Tsui, C.C. Huang, Q.F. Zhou and K.K. Shung. Cataract measurement by estimating the ultrasonic statistical parameter using an ultrasound needle transducer: an in vitro study. *Physiological Measurements* 32: 513-522, 2011. (PMC3100985)
  217. B.P. Zhu, Q.F. Zhou, C.H. Hu, K.K. Shung, E. Gorzkowski, and M.J. Pan. Novel Piezoelectric Ceramic-Polymer Aligned Composites via the Freeze Casting Method for High Frequency Transducer Applications. *Journal of Advanced Dielectrics* 1: 85-89, 2011 (PMC3141348)
  218. P.H. Tsui, C.C. Huang, L. Sun, S. Daily and K.K. Shung. Characterization of lamina propria and vocal muscle in human vocal fold tissue by ultrasound Nakagami imaging. *Medical Physics* 38: 2019-2026, 2011. (NIHMSID295535)
  219. J.W. Lee, J.H. Chang, J.S. Jeong, C. Lee, S.Y. The, A. Lee, and K.K. Shung. Single Droplet Scattering in Acoustic Trap. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 874-879, 2011. (PMC3107674)
  220. H. K. Chiang, Q. Zhou, M. S. Mandell, M.Y. Tsou, S.P. Lin, K. K. Shung, C. K. Ting. Eyes in the Needle - Novel Epidural Needle with Embedded High-frequency Ultrasound Transducer: Epidural Access in Porcine Model. *Anesthesiology* 114: 1-5, 2011. (PMC3104409)
  221. Z.Y. Shen, J.F. Li, R. Chen, Q. Zhou, K. K. Shung. Microscale 1-3-Type (Na,K)NbO<sub>3</sub>-Based Pb-Free Piezocomposites for High Frequency Ultrasonic Transducer Applications. *Journal of American Ceramics Society* 94: 1346–1349, 2011. (PMC3104299)
  222. Q. Su, B.P. Zhu, J. H. Lee, Z. Bi, K. K. Shung, Q. Zhou, S. Takeuchi, B.O. Park, Q. Jia, H. Wang. Self separated PZT Thick Films with Bulk-like Piezoelectric and Electromechanical Properties. *Journal of Materials Research* 26:1431-1435, 2011. (PMC3156471).
  223. J. Yin, X. Li, J. Jing, J. Li, Q. Zhou, D. Mukai, S. Mahon, A. Edris, K. Hoang, K. K. Shung, M. Brenner, J. Narula, and Z. Chen. Novel miniature optical coherence



- tomography (OCT) - ultrasound (US) probe and integrated imaging system. *Journal of Biomedical Optics* 16: 060505-1-060505-3, 2011 (PMC3124531).
224. Y. Yang, X. Li, T. Wang, P. D. Kumavor, A. Aguirre, K. K. Shung, Q. Zhou, Molly Brewer, Q. Zhu. Integrated Optical Coherence Tomography, Ultrasound and Photoacoustic Imaging for Ovarian Tissue Characterization. *Optics Express* 2: 2551-2561, 2011 (NIHMSID#322996).
  225. J.S. Jeong, J.W. Lee, C. Lee, S. Teh, A. Lee, and K. K. Shung. Particle manipulation in microfluidic channel using acoustic trap. *Biomedical Microdevices* 13: 779-788, 2011 (PMC3217264).
  226. C.H. Hu, L. Zhang, J. M. Cannata, J. Yen, K. K. Shung. Development of a 64 channel ultrasonic high frequency linear array imaging system. *Ultrasonics* 51: 953-959, 2011 (PMC3190571).
  227. B. Zhu, G. Shen, Q.F. Zhou, K.K. Shung. Structure and Electrical Properties of (111) Oriented  $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbZrO}_3\text{-PbTiO}_3$  Thin Film for ultrahigh frequency transducer applications. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 1962-1967, 2011 (PMC3181068).
  228. H.R. Chabok, Q.F. Zhou, S. Alagha, J. Tian. P. Han and K.K. Shung. Thickness dependent characteristics of high permittivity PMN-0.32 PT single crystal for high frequency medical imaging applications. *Ferroelectrics* 422: 1-7, 2011. (PMC3232676).
  229. H. Ji, W. Ren, L. Wang, P. Shi, X. Chen, X. Wu, Xi Yao, S.T. Lau, Q.F. Zhou, and K. K. Shung. Structure and electrical properties of  $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$  ferroelectric thick films derived from a polymer modified sol gel method. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 2042-2049, 2011 (PMC3232039).
  230. X. Li, W. Wu, Y. Chung, W. Y. Shih, W.H. Shih, Q. Zhou, and K. K. Shung. Novel PMN-PT free standing film for high frequency (80MHz) intravascular ultrasonic imaging. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 2281-2288, 2011(PMC3304502).
  231. K.K. Shung. Diagnostic ultrasound: past, present and future. *Journal of Medical and Biological Engineering.* 31: 371-374, 2011.
  232. H.J. Choi, X. Li, Xiang; S. Lau, C.H. Hu, Q.F. Zhou, K.K. Shung. Development of Integrated Preamplifier for High Frequency Ultrasonic Transducers and Low Power Hand-Held Receiver. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 2646-2658, 2011. (NIHMSID348230)
  233. J. Park, C.H. Hu, K.K. Shung. Standalone Frontend System for High Frequency, High Frame Rate Coded Excitation ultrasonic Imaging. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 2620-2630, 2011.(PMC3589806)

234. J. Cannata, J. Williams, L. Zhang, C.H. Hu, K.K. Shung. A High Frequency Linear Ultrasonic Array Utilizing an Interdigitally Bonded 2-2 Piezo-Composite. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 58: 2202-2212, 2011 (PMC3193138).
235. J. Park, J.W. Lee, S. T. Lau, C. Lee, Y. Huang, C.L. Lien, K.K. Shung. Acoustic Radiation Force Impulse (ARFI) Imaging of Zebrafish Embryo by High Frequency Coded Excitation Sequence. *Annals of Biomedical Engineering* 40: 907-915, 2012 (PMC3311748).
236. Y. Choe, J. Kim, K.K. Shung and E.S. Kim. Microparticle trapping in an ultrasonic Bessel beam. *Appl Phys Lett.* 99: 233704–1 - 233704-3, 2011.(PMC3253744)
237. J.W. Lee, A. Jakob, R. Lemor, and K. K. Shung. Targeted cell immobilization by microbeam ultrasound. *Biotechnology and Bioengineering* 108: 1643-1650, 2011 (PMC3098310).
238. S. Ye, R. Yang, J. Xiong, K. K. Shung, Q. Zhou, C. Li, and Q. Ren, Label-free imaging of zebrafish larvae in vivo by photoacoustic microscopy, *Biomedical Optics Express*, 3: 360-365, 2012. (PMC3269852).
239. C. Liu, F. Djuth, X. Li, R. Chen, X. Zhang, C. Hu, Q. Zhou, K. K. Shung. Micromachined High Frequency PMN-PT/Epoxy 1-3 Composite Ultrasonic Annular Array, *Ultrasonics*, 52: 497–502, 2012. (PMC3774318).
240. D. Maresca, K. Jansen, G. Renaud, G. van Soest, X. Li, Q. Zhou, N. de Jong, K. K. Shung, and A. F. W. van der Steen. Intravascular ultrasound chirp imaging. *Applied Physics Letter* 100: 043703 1-3, 2012.(Publisher provided directly to PMC).
241. G.S. Chen, C.Y. Lin, J.S. Joeng, J.M. Cannata, W.L. Lin, H. Chang, and K.K. Shung. Design and characterization of dual-curved 1.5-dimensional high intensity focused ultrasound phased array transducer. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 59: 150-155, 2012. (PMC22293475).
242. C. Zhang, K. Maslov, S. Hu, R.M. Chen, Q.F. Zhou, K.K. Shung, and L. V. Wang. reflection-mode submicron-resolution in vivo photoacoustic microscopy. *Journal of Biomedical Optics*. 17: 020511-01 – 03, 2012. (PMC22463018).
243. C.G. Liu, Q.F. Zhou, F.T. Djuth, K.K. Shung. High frequency (>50 MHz) medical ultrasonic linear array fabricated from micromachined bulk PZT materials. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 59: 315-318, 2012. (PMC3982855).
244. J.Y. Hwang, J.H. Park, B.J. Kang, D.J. Lubow, D. Chu, D.L. Farkas, K. K. Shung, L. K. Medina-Kauwe. Multimodality imaging in vivo for preclinical assessment of tumor-targeted Doxorubicin Nanoparticles. *PLoS ONE* 7: e34463, 2012. (PMC22892394) .
245. J. Park, C.H. Hu, X. Li, Q.F. Zhou, K.K. Shung. Wideband linear amplifier for high

- frequency coded excitation imaging system. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 59: 825-832, 2012. (PMID: 22547294).
246. H.S. Hsu, F. Zheng, Y. Li, C.Y. Lee, Q.F. Zhou and K.K. Shung. Focused high frequency needle transducer for ultrasonic imaging and trapping. *Applied Physics Letter* 101024105-1-3, 2012. (PMC3407142).
  247. H.S. Hsu, V. Benjauthrit, F. Zheng, R. Chen, Y. Huang, Q. Zhou, K.K. Shung. PMN-PT-PZT composite films for high frequency ultrasonic transducer applications. *Sensors and Actuators A: Physical* 179: 121-124, 2012. (PMC3674584)
  248. J.M. Yang, C. Favazza, R. Chen, J. Yao, X. Cai, K. Maslov, Q. Zhou, K.K. Shung, and L.H. Wang. Simultaneous functional photoacoustic and ultrasonic endoscopy of internal organs in vivo. *Nature Medicine* 18: 1297-1302, 2012. (PMC 22797808)
  249. F. Zheng, X. Zhang, C.T. Chiu, B. L. Zhou, K. Kirk Shung, H. F. Zhang, and S. Jiao. Laser-scanning photoacoustic microscopy with ultrasonic phased array transducer. *Biomed Optics Express* 3: 2694-2699, 2012. (PMID:23162708)
  250. W. Qiu, Y. Chan, X. Li, Y. Yu, F.C. Wang, F.K. Tsang, Q. Zhou, K.K. Shung, J. Dai and L. Sun. An open system for intravascular ultrasound imaging. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 59: 2201-2209, 2012. (PMC23143570)
  251. H.C. Yang, J. Williams, J. Cannata, K.K. Shung. Crosstalk-Reduction for High Frequency Linear Array Ultrasound Transducers Using 1-3 Piezocomposites with Pseudo-Random Pillars *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 59: 2312-2321, 2012. (PMC23145380)
  252. J. M. Cannata, T. Chilipka, H.C. Yang, S. Han, S. W. Ham, V. L. Rowe, F. A. Weaver, K. K. Shung, D. Vilkomerson. A Flexible Implantable Sensor for Post-Operative Monitoring of Blood Flow. *Journal of Ultrasound in Medicine* 31: 1795-1802, 2012. (PMC3762578).
  253. R. Chen, J. Wu, K.H. Lam, L. Yao, Q.F. Zhou, J. Tian, P. Han, K.K. Shung. Thermal-Independent Properties of PIN-PMN-PT Single Crystal Linear Array Ultrasonic Transducers. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 59: 2777-2784, 2012. (PMC3740094).
  254. J. Y. Hwang, J. Lee, C.Y. Lee, A. Jakob, R. Lemor, L.K. Medina-Kauwe, and K. K. Shung. Variation of fluorescence response to ultrasound microbeam (UM) stimulation in human HER2+ tumor cells and MCF-12F cells: a preliminary study. *Ultrasonics* 52: 803-808, 2012. (PMC 3392461)

255. J.M Yang, C. Favazza, J. Yao , C. Li, Z. Hu , Q. Zhou, K.K. Shung ,L.V. Wang. A 2.5-mm diameter probe for photoacoustic and ultrasonic endoscopy. *Optical Express*. 20:23944-53, 2012. (PMID: 23188360).
256. C.Y. Lee, J.W. Lee, H.H. Kim, S.Y. Teh, A. Lee, I.Y. Chung, J.Y. Park and K. K. Shung. Microfluidic Droplet Sorting with a High Frequency Ultrasound Beam. *Lab Chip*. 12:2736-42, 2012. (PMC3400154).
257. J.S. Jeong, J.H. Chang, K.K Shung. [Pulse compression technique for simultaneous HIFU surgery and ultrasonic imaging: a preliminary study](#). *Ultrasonics*. 52:730-739, 2012. (PMC2356771)
258. J. Park, X. Li, Q. Zhou, K.K. Shung. [Combined chirp coded tissue harmonic and fundamental ultrasound imaging for intravascular ultrasound: 20-60MHz phantom and ex vivo results](#). *Ultrasonics*. 53:369-76, 2013. (PMC3860271)
259. J. Lee, J.S. Jeong, K.K. Shung. [Microfluidic acoustic trapping force and stiffness measurement using viscous drag effect](#). *Ultrasonics* 53:249-54, 2013. (PMC22824623)
260. F. Zheng, Y. Li, H.S. Hsu, C. Liu, C. T. Chiu, C.Y. Lee, H. H. Kim, and K. K. Shung. Acoustic trapping with a high frequency linear phased array. *Applied Physics Letters* 101: 214104 -1-3, 2013. ([PMC3517499](#))
261. J.H. Park, Y. Huang, R. Chen, J.W. Lee, T. M. Cummins, Q.F. Zhou, C.L. Lien and K. K. Shung. Pulse Inversion Chirp Coded Tissue Harmonic Imaging (PI-CTHI) of Zebrafish Heart Using High Frame Rate Ultrasound Biomicroscopy. *Annals of Biomedical Engineering* 41: 41-52, 2013. (PMC22871273)
262. W. Qiu, Y. Yiu, H.R. Chabok, C. Liu, F.K. Tsang, Q. Zhou, K.K. Shung, H. Zheng, and L. Sun. A flexible Annular Array Imaging Platform for Micro-Ultrasound. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 60:178-186, 2013. (PMC3738186)
263. J. Emerson, D. Chang, S. McNaughton, J. Jeong, K.K. Shung, S. Cerwin. [Electromagnetic acoustic imaging](#). *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 60:364-372, 2013. (PMID:23357910)
264. C.H. Chang, Y.F. Chang, Y. Ma, K.K. Shung. [Reliable estimation of virtual source position for SAFT imaging](#). *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 60:256-263, 2013. (PMID: 23357909)
265. K. H. Lam, H.S. Hsu, Y. Li, C.Y. Lee, A. Lin, Q.F. Zhou, E.S. Kim, K. K. Shung. Ultrahigh Frequency Lensless Ultrasonic Transducers for Acoustic Tweezers Application. *Biotechnology and Bioengineering* 110: 881–886, 2013. (PMC 4090028)

266. K.H. Lam, HF Ji, F. Zheng, W. Ren, Q. Zhou Q, KK Shung. [Development of lead-free single-element ultrahigh frequency \(170-320MHz\) ultrasonic transducers.](#) Ultrasonics 2013 (PMID: 23485349).
267. D. Maresca, G. Renaud , G. van Soest G, X. Li, Q. Zhou, K.K. Shung , N. de Jong N, A.F. van der Steen. [Contrast-enhanced intravascular ultrasound pulse sequences for bandwidth-limited transducers.](#) Ultrasound Med Biol. 39:706-13, 2013. (PMC22384459).
268. R. Chen, D.G. Paeng, K.H. Lam, Q.F. Zhou, K.K. Shung, N. Matsuoka and M.S. Humayun. In vivo sonothrombolysis of ear marginal vein of rabbits monitored with high frequency ultrasound needle transducer. Journal of Medical and Biological Engineering, 33: 103-110, 2013. (PMC4209747).
269. K.H. Lam, H.F. Ji, F. Zheng, W. Ren, Wei, Q.F. Zhou, K.K. Shung. Development of lead-free single-element ultrahigh frequency (170 – 320 MHz) ultrasonic transducers. Ultrasonics 53: 1033–1038, 2013. (PMID: 23485349)
270. X. Zhou, L. Sun, Y. Yu, W. Qiu, C.L. Lien, K.K. Shung and W. Yu. Ultrasound bio-microscopic image segmentation for evaluation of zebrafish cardiac function. IEEE Trans Ultra. Ferroelect. Freq. Cont. 60:718-726, 2013. (PMC23559532)
271. J.S. Jeong and K.K. Shung. [Improved fabrication of focused single element P\(VDF-TrFE\) transducer for high frequency ultrasound applications.](#) Ultrasonics. 53:455-458, 2013. (PMC3774315).
272. D. T. Raphael, X. Li, J. Park, R. Chen, H. Chabok , A. Barukh, Q. Zhou, M. Elgazery, K. K. Shung, 20 MHz Forward-imaging single-element beam steering with an internal rotating variable-angle reflecting surface: Wire phantom and ex vivo pilot study, Ultrasonics, 53, 561-569, 2013. (PMID:23122968).
273. Y. Liu, K. H. Lam, K. K. Shung, J. Li, and Q. Zhou. Enhanced piezoelectric performance of composite sol-gel thick films evaluated using piezo-response force microscopy. J. Appl. Phys. 113: 187205, 2013. (PMC 3663855)
274. X. Yan, K.H. Lam, X. Li, R. Chen, Q. Zhou and K.K. Shung. Lead free intravascular transducer using BZT-50BCT ceramics. IEEE Trans Ultra. Ferroelect. Freq. Cont. 60: 1272-1276, 2013. (PMC 4090606)
275. J. Park, T. M. Cummins, M. Harrison, J. Lee, Q. Zhou, C.L. Lien, and K. K. Shung. High frequency photoacoustic imaging for in vivo visualizing blood flow of zebrafish heart. Optics Express 21: 14637-14642, 2013.
276. J.Y. Hwang, N.S. Lee, C. Lee, K.H. Lam, H.H. Kim, J. Woo, M.Y. Lin, K. Kisler, H. Choi, Q. Zhou, R.H. Chow, K.K. Shung. [Investigating contactless high frequency](#)

- ultrasound microbeam stimulation for determination of invasion potential of breast cancer cells. *Biotechnol Bioeng* 110:2697-705, 2013. (PMC3839413)
277. C.C. Shih, C.C. Huang, Q. Zhou, K.K. Shung. High-Resolution Acoustic-Radiation-Force-Impulse Imaging for Assessing Corneal Sclerosis. *IEEE Trans Med Imaging*. 32: 1316-1324, 2013. (PMC23584258).
278. B. Zhu, N. Y. Chan, J. Dai, K. K. Shung, S. Takeuchi, and Q. Zhou. New Fabrication of High-Frequency (100-MHz) Ultrasound PZT Film Kerfless Linear Array. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 60: 854-857, 2013. (PMC23549547)
279. T.Y. Liu, P.Y. Lee, C.C. Huang, L. Sun, K.K. Shung. A study of the adult zebrafish ventricular function by retrospective Doppler-gated ultra-high-frame-rate echocardiography. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 60: 1827-1837, 2013. (PMC4091976).
280. W. Qi, R. Li, T. Ma, J. Li, K. K. Shung, Q.F. Zhou, and Z.P. Chen. Resonant acoustic radiation force optical coherence elastography. *Appl. Phys. Lett.* 103, 103704, 2013; doi: 10.1063/1.4820252. (PMC3779257)
281. M. Lam, A.J. Chaudhari, Y. Sun, F. Zhou F, A. Dobbie, R.F. Gandour-Edwards, S.P. Tinling, D.G. Farwell, W.L. Monsky, K.K. Shung, L. Marcu L. Ultrasound backscatter microscopy for imaging of oral carcinoma. *J Ultrasound Med.* 32:1789-97, 2013. (PMC3835773).
282. H.S. Hsu, V. Benjauthrit, Q. Wei, Y. Huang, Q. Zhou, K.K. Shung. Silver Doped 0.9PMN-PT-0.1PZT Composite Films for very High Frequency Ultrasonic Transducer Applications. *Appl Phys A Mater Sci Process.* 111:459-463, 2013. (NIHMSID#: 582858)
283. J. Li, T. Ma, J. J. Zhang, P.M. Patel, K. K. Shung, Q. Zhou, Z. Chen. Miniature optical coherence tomography- ultrasound probe for automatically coregistered three-dimensional intracoronary imaging with real-time display. *J Biomed Optics Let* 18: 100502 1-3, 2013.
284. C. Liu, F.T. Djuth, Q. Zhou, and K.K. Shung. Micromaching techniques in developing high frequency piezoelectric composite ultrasonic array transducers. *IEEE Trans Ultra Ferroelect. Freq. Cont.* 60: 2615-2625, 2013. (PMC4077999)
285. Z. Xie, S.L. Chen, M.L. Fabiilli, J.B. Fowlkes, K.K. Shung, Q. Zhou, P.L. Carson, X. Wang. Simultaneous viewing of individual cells and ambient microvasculature using optical absorption and fluorescence contrasts. *Mol Imaging.* 12:491-496, 2013. (PMC4060516)
286. Y.C. Chen, Y.H. Lin, S.H. Wang, S.P. Lin, K.K. Shung, C.C. Wu. Monitoring tissue inflammation and responses to drug treatments in early stages of mice bone fracture using 50MHz ultrasound. *Ultrasonics.* 54:177-86, 2014. (PMC4047674)

287. T. Ma, X Zhang, C.T. Chiu, R. Chen, K.K. Shung, Q. Zhou and S. Jiao. Systematic Study of High-frequency Ultrasonic Transducers Design for Laser-scanning Photoacoustic Ophthalmoscopy. *Journal of Biomedical Optics* 19: 016015-1-7, 2014. (PMC3895818).
288. J. Li, X. Li, D. Mohar, A. Raney, J. Jing, J. Zhang, A. Johnston, S. Liang, T. Ma T, K.K. Shung, S. Mahon, M Brenner, J. Narula, Q. Zhou, P.M. Patel, Z. Chen. Integrated IVUS-OCT for Real-Time Imaging of Coronary Atherosclerosis. *J American College Cardiology Cardiovasc Imaging*. 7:101-103, 2014. (PMC3970778).
289. H. Choi and K.K. Shung. Novel power MOSFET-based expander for high frequency ultrasound systems. *Ultrasonics*. 54:121-130, 2014. (PMC4078002)
290. H. Choi, H.C. Yang, K.K. Shung. Bipolar-power-transistor-based limiter for high frequency ultrasound imaging systems. *Ultrasonics* 54:754-758, 2014. (NIHMSID: 580817)
291. K. Jansen, A. F.W. van der Steen, M. Wu, H. M.M. van Beusekom, G. Springeling, X. Li, Q. Zhou, K. K. Shung, D. P.V. de Kleijn, and G.s van Soesta. Spectroscopic intravascular photoacoustic imaging of lipids in atherosclerosis. *Journal of Biomedical Optics* 19: 026006-1-9, 2014.
292. Y.H. Lin, K.L. Tung, S.H. Wang, Q.F. Zhou, and K.K. Shung. Distribution and Deposition of organic fouling on microfiltration membrane by high frequency ultrasound. *Journal of Membrane Science* 433: 100-113, 2013. (NIHMSID:582640)
293. L. Chiye, J.M. Yang, R. Chen, C.H. Yeh, L. Zhu, K. Maslov, Q. Zhou, K. K. Shung, and L.V. Wang. Urogenital photoacoustic endoscope. *Optical Letters* 39: 1473-1476, 2014.
294. J.Y. Hwang, C. Lee, K.H. Lam, H.H. Kim, J.W. Lee, and K.K Shung. Cell membrane deformation induced by a fibronectin-coated polystyrene microbead in a 200 MHz acoustic trap. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control* 61: 399-406, 2014. (PMC4030728)
295. W. Qi, R. Li, T. Ma, K. K. Shung, Q. Zhou, and Z. Chen. Confocal acoustic radiation force optical coherence elastography using a ring ultrasonic transducer. *Applied Physics Letters* 104, 123702 1-4, 2014. (PMC3971820).
296. X. Li, J. Li, J. Jing, T. Ma, J. Zhang, D. Mohar, A. Raney, S. Mahon, M. Brenner, P. Patel, K. K. Shung, Qifa Zhou, and Z. Chen. Integrated IVUS-OCT Imaging for Atherosclerotic Plaque Characterization. *IEEE Journal of Selected Topics in Quantum Electronics* 20: 7100108, 2014. (PMC3996710).
297. Z. Zhou, C.-C Huang, K. K. Shung, P.-H. Tsui, J. Fang, H.- Y. Ma, S. Wu, C.-C. Lin. Entropic Imaging of Cataract Lens: An in vitro Study. *PLoS ONE* 9: e96194, 2014.

- (PMC3997556).
298. H. Choi and K.K. Shung. Protection Circuits for Very High Frequency Ultrasound Systems. *Journal of Medical Systems* 38:34, 2014. (PMC4138227).
  299. R. Chen, N. Cabrera, K. H. Lam, H. Hsu, F. Zheng, Q. Zhou, and K. K. Shung, PMN-PT Single Crystal High Frequency Kerfless Phased Array. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control* 61: 1033-1041, 2014. (PMC4477951)
  300. J.M. Yang, C. Li, R. Chen R, Q. Zhou, K.K. Shung, L.V. Wang. [Catheter-based photoacoustic endoscope](#). *Journal of Biomedical Optics*. 19:66001. doi: 10.1117/1, 2014. (PMC4041025)
  301. L. Li, C. Yeh, S. Hu, L. Wang, B.T. Soetikno, R. Chen, Q. Zhou, K. K. Shung, K.I. Maslov, and L. V. Wang. Fully motorized optical-resolution photoacoustic microscopy. *Optical Letters* 39: 2117-2120, 2014. (PMC4048805)
  302. X. Li, T. Ma, J. Tian, P. Han, Q. Zhou, K.K. Shung. Micromachined PIN-PMN-PT crystal composite transducer for high frequency intravascular ultrasound (IVUS) imaging. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control* 61: 1171-1178. 2014. (PMC4414317)
  303. C.H. Chang, Y.F. Chang, R.C. Shih, and K. K. Shung. Ultrasonic synthetic aperture focusing technique with finite source element for focused transducers. *Journal of Testing and Evaluation* 42: 842-850, 2014.
  304. Q. Zhou, K. H. Lam, H. Zheng, W. Qiu, K. K. Shung. Piezoelectric single crystal ultrasonic transducers for biomedical applications. *Progress in Materials Science* 66: 87-111, 2014.(PMC4223717)
  305. J.Y. Hwang, C.W. Yoon, K.H. Lam, H.G. Lim, S. Yoon, C. Lee, C.T. Chiu, B. J. Kang, and K. K. Shung. Non-contact high-frequency ultrasound microbeam stimulation for studying mechanotransduction in human umbilical vein endothelial cells. *Ultrasound in Medicine and Biology* 40: 2172-2182, 2014. (PMC4130794)
  306. Y. Li and K.K. Shung. A feasibility study of *in vivo* applications of single beam acoustic tweezers. *Applied Physics Letters* 105, 173701: 1-5, 2014. (PMC4224677).
  307. P. Wang, T. Ma, M. Slipchenko, S. Liang, J. Hui, K.K. Shung, S. Roy, M. Sturek, Q. Zhou, Z.P. Chen, and J.X Cheng. High-speed Intravascular Photoacoustic Imaging of Lipid-laden Plaques Enabled by a 2-kHz Barium Nitrite Raman Laser. *Nature: Scientific Reports* 4 : 6889 1-7 | DOI: 10.1038/srep06889, 2014. (NIHMS#679995)
  308. S. Liang, T. Ma, J. Jing, X. Li, J. Li, K. K. Shung, Q. Zhou, J. Zhang, and Z. Chen. Trimodality imaging system and intravascular endoscopic probe: combined optical



- coherence tomography, fluorescence imaging and ultrasound imaging. *Optical Express* 39: 6652-6655, 2014.(PMC4356628)
309. C. Yoon, B. Kang, C. Lee, H.H. Kim and K.K. Shung. Multi-particle trapping and manipulation by a high-frequency array transducer. *Applied Physics Letters* 105: 214103 1-4; doi: 10.1063/1.4902923, 2014 (PMC4247372).
  310. B. J. Kang, J. Park, J. Kim, H. H. Kim, C. Lee, J. Y. Hwang, C.L. Lien, and K. K. Shung. High frequency dual mode pulsed wave Doppler imaging for monitoring the functional regeneration of adult zebrafish hearts. *Journal of Royal Society Interface* 12: 20141154 1-10, 2014. (PMC4305417).
  311. C. Lee, J. S. Jeong, J. Y. Hwang, J.W. Lee and K. K. Shung. Non-contact Multi-Particle Annular Patterning and Manipulation with Ultrasound Microbeam. *Applied Physics Letters* 104:244107, 2014. (PMC4098038)
  312. J. Lee, H. Cao, B.J. Kang, N. Jen, F. Yu, C. Lee, P. Fei, J. Park, S. Bohlool, L. Rosenberg, K. K. Shung, and T.K. Hsiai. Hemodynamics and Ventricular Function in a Zebrafish Model of Injury and Repair. *Zebrafish*. 11: 447-454, 2014. (PMC4172470)
  313. J. Y. Hwang, B. J. Kang, C. Lee, H. H. Kim, J. Park, Q. Zhou, and K. K. Shung. Acoustic radiation force impulse microscopy via photoacoustic detection for probing mechanical properties of single cells. *Biomedical Optics Express* 6: 11-22, 2015. (PMC4317122)
  314. P. Gui, K. Sun, G. Zheng, R. Wang, X. Xu, I. Oguzman, K. Vasanth, Q. Zhou, K. K. Shung. A 180 Vpp integrated linear amplifier for ultrasonic imaging applications in a high-voltage CMOS SOI technology. *IEEE Transactions on Circuits and Systems II* 62: 149-153, 2015. (PMC4406254)
  315. T. Ma, M. Yu, C. Fei, Z. Chen, K. K. Shung, and Q. Zhou. Multi-frequency Intravascular Ultrasound (IVUS) Imaging. *IEEE Trans Ultra. Ferroelect. Freq. Cont.* 62: 97-107, 2015. (NIHMS#679569)
  316. T. Ma, X. Qian, C.T. Chiu, M. Yu, H. Jung, Y. Tung, K. K. Shung and Q. Zhou. High-resolution harmonic motion imaging (HR-HMI) for tissue biomechanical property characterization. *Quantitative Imaging of Medicine and Surgery* 5: 108-117, 2015. (PMC4312300)
  317. J. Ma, K. H. Martin, Y. Li, P. A. Dayton, K. K. Shung, Q. Zhou and X. Jiang. Design factors of intravascular dual frequency transducers for super-harmonic contrast imaging and acoustic angiography. *Phys. Med. Biol.* 60: 3441 [doi:10.1088/0031-9155/60/9/3441](https://doi.org/10.1088/0031-9155/60/9/3441), 2015.
  318. K. Jansen, A.F.W. van der Steen, M. Wu, H. van Beusekom, G. Springeling, X. Li, Q. Zhou, K. K. Shung, D. de Kleijn, G. van Soest, Spectroscopic intravascular

- photoacoustic imaging of lipids in atherosclerosis, *Journal of Biomedical Optics*, 19: 026006, 2014. (PMID:24522806).
319. J. Zhu, Y. Qu, T. Ma, R. Li, Y. Du, S. Huang, K. K. Shung, Q. Zhou, and Z. Chen. Imaging and characterizing shear wave and shear modulus under orthogonal acoustic radiation force excitation using OCT Doppler variance method. *Optics Letters* 40: 2009-2012, 2015.
  320. B. Zhu, Z. Zhang, T. Ma, X. Yang, Y. Li, K.K. Shung, and Q. Zhou. (100)-Textured KNN-based Thick Film with Enhanced Piezoelectric Property for Intravascular Ultrasound Imaging. *Applied Physics Letter* 106: 173504 1-3 (PMC4417015).
  321. K.K. Shung. Ultrasound. A chapter in “Essentials in In Vivo Imaging”, editors: S. Cherry, R. Badawi, and J. Qi, CRC Press, Boca Raton, FL, May, 2015.
  322. [Z. He](#), [F. Zheng](#), [Y. Ma](#), [H. H. Kim](#), [Q. Zhou](#) and [K. K. Shung](#). A sidelobe suppressing near-field beamforming approach for ultrasound array imaging. *Journal of the Acoustical Society of America* 137: 2785-2790, 2015.
  323. S. Yoon, J. Williams, B. J. Kang, C. Yoon, N. Cabrera-Munoz, J. S. Jeong, S. G. Lee, K. K. Shung, H. H. Kim. Angled-focused 45 MHz PMN-PT single element transducer for intravascular ultrasound imaging. *Sensors and Actuators: A Physics* 228:16-22, 2015.
  324. J. Yang, C. Favazza, J. Yao, R. Chen, Q. Zhou, K. K. Shung, and L. V. Wang. Three dimensional photoacoustic endoscopic imaging of the rabbit esophagus. *PLoS One* 10(4): e0120269, 2015.
  325. J. Li, H. Minami, E. Steward, T. Ma, D. Mohar, C. Robertson, K. Shung, Q. Zhou, P. Patel, and Z. Chen. Optimal flushing agents for integrated optical acoustic imaging systems. *Journal of Biomedical Optics* 20:56005. doi: 10.1117/1, 2015.
  326. B. J. Kang, C. Yoon, J. Park, J.Y. Hwang, and K. K. Shung. A Jitter Reduction Technique for Acoustic Radiation Force Impulse Microscopy via Photoacoustic Detection. *Optical Express* 23: 19166-19175, 2015.
  327. S. Yoon, M.G. Kim, J. Williams, C. Yoon, N. Cabrera-Munoz, B.J. Kang, K.K. Shung and H.H. Kim. Dual element needle transducer for intravascular ultrasound imaging. *Journal of Medical Imaging* 2:027001, doi: 10.1117, 2015.
  328. J.Y. Hwang, H. G. Lim, C. W. Yoon, J.W. Lee, and K. K. Shung. Acoustic tweezers for studying intracellular calcium signaling in SBKR-3 human breast cancer cells. *Ultrasonics* 63:94-101, 2015. (PMC4857610)
  329. N. S. Lee, O.V. Evgrafov, T. Souaiaia, A. Bonyad, J. Y. Lee, Y. Ning, M. Sixtyo, A. C. Weitz, M. F. Press, H.-J. Lenz, K. Wang<sup>3</sup>, J. A. Knowles, P. M. Salvaterra, K. K. Shung, R. H. Chow. Small non-coding RNAs derived from a *REST* alternatively spliced

- transcript regulate breast cancer invasiveness. *Scientific Reports* 5: 11207, 2015. (PMC4459148)
330. K.K. Shung and J. Yen. "Arrays and Beamformers" a chapter in *Ultrasonic Imaging and Therapy* edited by J. Lacefield and A. Fenster CRC Press, 2015.
331. H. Cao, B. J. Kang, K. K. Shung, N.C. Chi, and T. K. Hsiai. Electrical and Mechanical Strategies to Enable Cardiac Repair and Regeneration. *IEEE Reviews on Biomedical Engineering*, 8: 114-124, 2015.
332. C. Fei, J. Ma, C. T. Chiu, J. A. Williams, W. Fong, Z. Chen, B. Zhu, R. Xiong, J. Shi, T. K. Hsiai, K. K. Shung, and Q. Zhou. Design of matching layers for high-frequency ultrasonic transducers. *Applied Physics Letters* 107:123505, 2015.
333. M. G. Kim, S. Yoon, H. H. Kim, K. K. Shung. Impedance Matching Network for High Frequency Ultrasonic Transducer for Cellular Applications. *Ultrasonics*, doi: 10.1016/j.2015. (PMC4656103)
334. T. Ma, B. Zhou, T.K. Hsiai, and K.K. Shung. Intravascular Ultrasound (IVUS)-based Multimodal Intravascular Imaging System: The Synergistic Approach to Characterizing Vulnerable Plaques. *Ultrasonic Imaging* 1-19 DOI: 10.1177/0161734615604829, 2015.
335. C.Y. Lee, H. Jung, H. K. Lam, C. Yoon, K.K. Shung. Ultrasonic Scattering Measurements of Live Single Cells at 86 MHz. *IEEE Trans. Ultras. Ferroelec. Freq. Cont.* 62: 1968-1977, 2015. (PMC4851106)
336. J. Li, T. Ma, D. Mohar, E. Steward, M. Yu, Z. Piao, Y. He, F. Kolodgie, R. Virmani, K. K. Shung, Q. Zhou, P. M. Patel, and Z. Chen. Ultrafast optical-ultrasonic system and miniaturized endoscopy for volumetric imaging and characterizing atherosclerotic plaques in vivo. *Scientific Report*. 18:18406. doi: 10.1038/srep18406, 2015 (PMC4683418).
337. Y. Li, J. Ma, K. Martin, M. Yu, T. Ma, P. A. Dayton, X.N. Jiang, K. K. Shung, Q.F. Zhou. An Integrated System for Super-Harmonic Contrast-Enhanced Ultrasound Imaging: Design and Intravascular Phantom Imaging Study. *IEEE Trans. Biomed Eng.* DOI 10.1109/TBME.2015.2506639, 2015. (PMID: 26672030)
338. S. Lin, Y. Lin, S. Fan, B. Huang, W.Y. Lin, S.H. Wang, K.K. Shung, F.C. Su, and C.C. Wu. Cross-Sectional Nakagami Images in Passive Stretches Reveal Damage of Injured Muscles. *Biomedical Research International* 2016: Article ID 6893712 1-11, 2016. (PMC4806670)
339. Y.J. Chang, H.C. Huang, Y.Y. Hsueh, S.W. Wang, F.C. Su, C.H. Chang, M.J. Tang, Y.S. Li, S.H. Wang<sup>7</sup>, K.K. Shung, S. Chien, C.C. Wu. Role of Excessive Autophagy

- Induced by Mechanical Overload in Vein Graft Neointima Formation: Prediction and Prevention. *Scientific Reports* 6:22147. doi: 10.1038/srep22147, 2016. (PMC4768319)
340. S. Yoon, M. G. Kim, J. Y. Hwang, H. H. Kim, Y. Wang, K. K. Shung. Direct and sustained intracellular delivery of exogenous molecules using acoustic-transfection with high frequency ultrasound. *Scientific Reports* 22:6:20477. doi: 10.1038/srep20477, 2016. (PMC4740885)
341. [B. Zhu](#), [J. Xu](#), [Y. Li](#), [T. Wang](#), [K. Xiong](#), [C. Lee](#), [X. Yang](#), [M. Shiiba](#), [S. Takeuchi](#), [Q. Zhou](#), and [K. K. Shung](#). Micro-particle manipulation by single beam acoustic tweezers based on hydrothermal PZT thick film. *AIP Advances* 6(3): 035102. doi: [10.1063/1.4943492](#), 2016 (PMC4788601).
342. T. Cummins, C. Yoon, H. Choi, P. Eliahoo, H. Kim, M. Yamashita, L. Larsen, J. Lang, S. Sener, J. Vallone, S. Martin and K.K. Shung. High Frequency Ultrasound Imaging for Breast Cancer Biopsy Guidance. *J Medical Imaging* 2:047001. doi: 0.1117/1.JMI.2.4.047001. 2015. (PMC4675170)
343. T. Cummins, P. Eliahoo, K.K. Shung. High Frequency Ultrasound Array Designed for Ultrasound Guided Breast Biopsy. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* 63: 817-827, 2016. (NIHMS# 791561) Selected for cover of the issue.
344. C. Fei, C.T. Chiu, X. Chen, Z. Chen, J. Ma, B. Zhu, K.K. Shung, Q. Zhou. Ultrahigh Frequency (100 MHz-300 MHz) Ultrasonic Transducers for Optical Resolution Medical Imaging. *Scientific Reports* 22:6:28360. doi: 10.1038/srep28360, 2016. (PMC4916450)
345. Y. Qu, T. Ma, Y. He, J. Zhu, C. Dai, M. Yu, S. Huang, F. Lu, K.K. Shung, Q. Zhou, Z. Chen Z. Acoustic Radiation Force Optical Coherence Elastography of Corneal Tissue. *IEEE Journal Selective Top Quantum Electron.* 22: pii: 6803507, 2016. (PMC4896493).
346. Z. Chen, X. Song, L. Lei, X. Chena, C. Fei, C.T. Chiu, X. Qian, T. Ma, Y. Yang, K.K. Shung, Y. Chen, Q. Zhou. 3D printing of piezoelectric element for energy focusing and ultrasonic sensing. *Nano Energy* 27: 78–86, 2016.
347. ***J.Y. Hwang, J. Kim, J.M. Park, C. Lee, H. Jung, J. Lee, K.K. Shung. Cell Deformation by Single-beam Acoustic Trapping: A Promising Tool for Measurements of Cell Mechanics. Scientific Reports 6:27238. doi: 10.1038/srep27238, 2016. (PMC4897707)***
348. T. Ma, B. Zhou, T. K. Hsiai, and K. K. Shung. A Review of Intravascular Ultrasound-based Multimodal Intravascular Imaging: The Synergistic Approach to Characterizing Vulnerable Plaques. *Ultrasonic Imaging* 38: 314–331, 2016.
349. Y. Li, J. Ma, K.H. Martin, M. Yu, T. Ma, P.A. Dayton, X. Jiang, K.K. Shung, Q. Zhou. An integrated system for superharmonic contrast-enhanced ultrasound imaging: design and intravascular phantom imaging study. *IEEE Transactions on Biomedical Engineering*

- 63: 1933-1943, 2016.
350. H.G. Lim, Y. Li, M.Y. Lin, C. Yoon, C. Lee, H. Jung, R.H. Chow, K.K. Shung. Calibration of Trapping Force on Cell-Size Objects From Ultrahigh-Frequency Single-Beam Acoustic Tweezer. *IEEE Trans Ultrason Ferroelectr Freq Control*. 63:1988-1995, 2016.
  351. J. Ma, Y. Luo, P. Sevag, T. Ma, Y. Ding, P. Abiri, Y.C. Tai, Q. Zhou, K.K. Shung, R. Li, T. Hsiai. Ultrasonic Transducer-Guided Electrochemical Impedance Spectroscopy to Assess Lipid-Laden Plaques. *Sens Actuators B Chem*. 235:154-161, 2016.
  352. [C. Fei](#), [Y. Li](#), [B. Zhu](#), [C. T. Chiu](#), [Z. Chen](#), [D. Li](#), [Y. Yang](#), [K. K. Shung](#) and [Q. Zhou](#). Contactless microparticle control via ultrahigh frequency needle type single beam acoustic tweezers. *Applied Physics Letters* 109: 173509, 2016.
  353. [K.H. Lam](#), [Y. Li](#), [Y. Li](#), [H.G. Lim](#), [Q. Zhou](#), and [K.K. Shung](#). Multifunctional single beam acoustic tweezer for non-invasive cell/organism manipulation and tissue imaging. *Scientific Report*, 6: 37554, doi : [10.1038/srep37554](https://doi.org/10.1038/srep37554), 2016. (PMC5118718)
  354. Y.J. Chang, H.C. Huang, Y.Y. Hsueh, S.W. Wang, F.C. Su, C.H. Chang, M.J. Tang, Y.S. Li, S.H. Wang, K.K. Shung, S. Chien, C.C. Wu. Corrigendum: Role of Excessive Autophagy Induced by Mechanical Overload in Vein Graft Neointima Formation: Prediction and Prevention. *Scientific Report*, 6:31256. doi: 10.1038/srep31256 2016. (PMC5107935)
  355. Y. Yang, Z. Chen, X. Song, Z. Zhang, J. Zhang, K. K. Shung, Q. Zhou, and Y. Chen. Biomimetic Anisotropic Reinforcement Architectures by Electrically Assisted Nanocomposite 3D Printing. *Advanced Materials* 1605750, 2017.
  356. H.C. Liu, Y. Li, K. K. Shung. Acoustic Trapping of Red Blood Cells and Micro Particles in flowing RBC Saline and Plasma Suspensions. *Ultrasound in Medicine and Biology* 43: 852-859, 2017.
  357. J. Zhang, Y. Zhang, Y. Li, R. Chen, K. K. Shung, G. Richter, and Q. Zhou. Correlation of IOP with Corneal Acoustic Impedance in Porcine Eye Model. *BioMed Research International* 2017: Article ID 2959717, <https://doi.org/10.1155/2017/2959717>, 2017
  358. X. Qian, T. Ma, M. Yu, X. Chen, K.K. Shung, Q. Zhou. Multi-functional Ultrasonic Micro-elastography Imaging System. *Scientific Report* 27: 7(1):1230. doi: 10.1038/s41598-017-01210-8, 2017. (PMC5430777)
  359. C. Yoon, H. H. Kim, and K. K. Shung. Development of low complex, cost effective digital beamformer architecture for high-frequency ultrasound imaging. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control* 64: 1002-1008, 2017.

360. A.C. Weitz, N.S. Lee, C.W. Yoon, A. Bonyad, K.S. Goo, S. Kim, S. Moon, H. Jung, Q. Zhou, R.H. Chow and K.K. Shung. Functional Assay of Cancer Cell Invasion Potential Based on Mechanotransduction of Focused Ultrasound. *Front. Oncol.* 7:161. doi: 10.3389/fonc.2017.00161, 2017.
361. M.G. Kim, S. Yoon, C.T. Chiu, and K.K. Shung. Investigation of Optimized Treatment Conditions for Acoustic-Transfection Technique for Intracellular Delivery of Macromolecules. *Ultrasound. Med. Biol.* doi: 10.1016/j.ultrasmedbio.2017, 2017.
362. T. Wong, R. Zhang, C. Zhang, H.C. Hsu, K.I. Maslov, L. Wang, J. Shi, R. Chen R, K.K. Shung, Q. Zhou, L.V. Wang. Label-free automated three-dimensional imaging of whole organs by microtomy-assisted photoacoustic microscopy. *Nat. Commun.* 9: 1386, 2017.
363. Y. Duchartre, S. Bachl, H.N. Kim, E.J. Gang, S. Lee, H.C. Liu, K. Shung, R. Xu, A. Kruse, G. Tachas, H. Bonig, Y.M Kim. Effects of CD49d-targeted antisense-oligonucleotide on  $\alpha 4$  integrin expression and function of acute lymphoblastic leukemia cells: Results of in vitro and in vivo studies. *PLoS One.*12(11):e0187684. doi: 10.1371/journal.pone.018768, 2017.
364. M.G. Kim, J. Park J, H.G. Lim, S. Yoon, C. Lee, J.J. Chang, K.K. Shung. Label-free analysis of the characteristics of a single cell trapped by acoustic tweezers. *Sci. Rep.* 26:14092. doi: 10.1038/s41598-017-14572-w, 2017.
365. B. Zhu, C. Fei, C. Wang, Y. Zhu, X. Yang, H. Zheng, Q. Zhou, K.K. Shung. Self-Focused AlScN Film Ultrasound Transducer for Individual Cell Manipulation. *ACS. Sens.* 27:172-177. doi: 10.1021/acssensors.6b00713, 2017.
366. S. Yoon, P. Wang, Q. Peng, Y. Wang, K.K. Shung. Acoustic-transfection for genomic manipulation of single-cells using high frequency ultrasound. *Sci. Rep.* 13:5275. doi: 10.1038/s41598-017-05722-1, 2017.
367. M. Yu, Y. Li, T. Ma, K.K. Shung, Q. Zhou. Intravascular Ultrasound Imaging With Virtual Source Synthetic Aperture Focusing and Coherence Factor Weighting. *IEEE Trans. Med. Imaging.* 36:2171-2178. doi: 10.1109/TMI.2017.2723479, 2017
368. Y. Qu, T. Ma T, Y. He, M. Yu, J. Zhu, Y. Miao, C. Dai, P. Patel, K.K. Shung, Q. Zhou, Z. Chen. Miniature probe for mapping mechanical properties of vascular lesions using acoustic radiation force optical coherence elastography. *Sci. Rep.*7:4731. doi: 10.1038/s41598-017-05077-7, 2017.
369. X. Chen, K.H. Lam, R. Chen, Z. Chen, P. Yu P, K.K. Shung, Q. Zhou. An adjustable multi-scale single beam acoustic tweezers based on ultrahigh frequency ultrasonic transducer. *Biotechnol. Bioeng.* 114:2637-2647. doi: 10.1002/bit.26365, 2017.
370. C.T. Chiu, B.J. Kang, P. Eliahoo, T. Abraham, K.K. Shung. Fabrication and Characterization of a 20-MHz Microlinear Phased-Array Transducer for Intervention

- Guidance. IEEE Trans. Ultrason. Ferroelectr. Freq. Control. 64:1261-1268. doi: 10.1109/TUFFC.2017.2709623, 2017.
371. H.G. Lim, K.K. Shung. Quantification of Inter-Erythrocyte Forces with Ultra-High Frequency (410 MHz) Single Beam Acoustic Tweezer. Ann Biomed Eng. 45:2174-2183. doi: 10.1007/s10439-017-1863-z, 2017.
372. Z. Chen, L. Zheng, W. Cao, X. Chen, R. Chen, R. Li, K.K. Shung, Q. Zhou. High-Frequency Ultrasonic Imaging with Lead-free (Na,K)(Nb,Ta)O<sub>3</sub> Single Crystal. Ultrason Imaging. 39:348-356. doi: 10.1177/0161734617701069, 2017
373. J. Peng, X. Peng, H. Tang, X. Li, R. Chen, Y. Li, T. Wang, S. Chen, K.K. Shung, Q. Zhou. Fabrication and Performance of a Miniaturized and Integrated Endoscope Ultrasound Convex Array for Digestive Tract Imaging. IEEE Trans. Biomed. Eng. 65:140-148. doi: 10.1109/TBME.2017.2696560, 2018.
374. C.W. Yoon, H. Jung, K. Goo, S. Moon, K.M. Koo, N.S. Lee, A.C. Weitz, K.K. Shung. Low-Intensity Ultrasound Modulates Ca<sup>2+</sup> Dynamics in Human Mesenchymal Stem Cells via Connexin 43 Hemichannel. Ann. Biomed. Eng. 46:48-59. doi: 10.1007/s10439-017-1949-7, 2018.
375. Y. Pan, S. Yoon, J. Sun, Z. Huang, C. Lee, M. Allen, Y. Wu, Y.J. Chang, M. Sadelain, K.K. Shung, S. Chien, Y. Wang. Mechanogenetics for the remote and noninvasive control of cancer immunotherapy. Proc. Natl. Acad. Sci. pii: 201714900. doi: 10.1073/pnas.1714900115, 2018.
376. P. Lin, C. Fei, S. Hou, T. Zhao, Q. Chen, Y. Quan, K. K. Shung, and Q. Zhou. 0.36BiScO<sub>3</sub>-0.64PbTiO<sub>3</sub>/Epoxy 1-3 Composite for Ultrasonic Transducer Applications. IEEE Sensors Journal, 18: 5685-5690, 2018.
377. R.T. Zaman, S. Yousefi, S.R. Long, T. Saito, M. Mandella, Z. Qiu, R. Chen, C. H. Contag, S. Gambhir, F.T. Chin, B.T. Khuri-Yakub, M.V. McConnell, K. K. Shung & L.Xing. A Dual-Modality Hybrid Imaging System Harnesses Radioluminescence and Sound to Reveal Molecular Pathology of Atherosclerotic Plaques. Scientific Reports 8:8992, DOI:10.1038/s41598-018-26696-8, 2018.
378. H. Jung, R. Wodnicki, H.H. Lim, C.W. Yoon, B. Kang B, C. Yoon, C. Lee, J.Y. Hwang, H.H. Kim, H. Choi, M.S. Chen, Q. Zhou, K.K. Shung, CMOS High Voltage Analog 1-64 Multiplexer/De-Multiplexer for Integrated Ultrasound Guided Breast Needle Biopsy. IEEE Trans. Ultrason. Ferroelectr. Freq. Control. doi: 10.1109/TUFFC.2018.2837127, 2018.
379. C.C. Shih, X. Qian, T. Ma, Z. Han, C.C. Huang, Q. Zhou, K.K. Shung, Quantitative assessment of thin-layer tissue viscoelastic properties using ultrasonic micro-elastography with Lamb wave model. IEEE Trans. Med. Imaging. doi: 10.1109/TMI.2018.2820157, 2018.

380. X. Qian, T. Ma, C.C. Shih, M. Heur, Z. Jun, K.K. Shung, R. Varma, M. Humayun, Q. Zhou. Ultrasonic Micro-Elastography to Assess Biomechanical Properties of the Cornea. IEEE Trans Biomed Eng. doi: 10.1109/TBME.2018.2853571, 2018.
381. C.C. Shih, P.Y. Chen, T. Ma, Q. Zhou, K.K. Shung, C.C. Huang. Development of an intravascular ultrasound elastography based on a dual-element transducer. Royal Soc. Open Sci. 25:180138. doi: 10.1098/rsos.180138, 2018.
382. Z. Zhang, F. Li, R. Chen, T. Zhang, X. Cao, S. Zhang, T.R. Shrout, H. Zheng, K.K. Shung, M.S. Humayun, W. Qiu, Q. Zhou. High-Performance Ultrasound Needle Transducer Based on Modified PMN-PT Ceramic with Ultrahigh Clamped Dielectric Permittivity. IEEE Trans Ultrason Ferroelectr Freq Control. 65:223-230. doi: 10.1109/TUFFC.2017.2778738, 2018.
383. H.C. Liu, E.J. Gang, H.N. Kim, H.G. Lim, H. Jung, R. Chen, H. Abdel-Azim, K.K. Shung, Kim YM. Characterizing Deformability of Drug Resistant Patient-Derived Acute Lymphoblastic Leukemia (ALL) Cells Using Acoustic Tweezers. Sci Rep. 24:15708. doi: 10.1038/s41598-018-34024-3, 2018.
384. R. Chen, L. Jiang, T. Zhang, T. Matsuoka, M. Yamazaki, X. Qian, G. Lu, A. Safari, J. Zhu, K.K. Shung T. Ma T, Q. Zhou. Eco-friendly highly sensitive transducers based on a new KNN-NTK-FM lead-free piezoelectric ceramic for high-frequency biomedical ultrasonic imaging applications. IEEE Trans. Biomed. Eng. doi: 10.1109/TBME.2018.2876063, 2018.
385. P.Y. Chen, C.C. Shih, W.C. Lin, T. Ma, Q. Zhou, K.K. Shung, C.C. Huang. High-Resolution Shear Wave Imaging of the Human Cornea Using a Dual-Element Transducer. Sensors (Basel):18, pii: E4244. doi: 10.3390/s18124244, 2018.
386. Y. Qu, C. Li, J. Shi, R. Chen, S. Xu, H. Rafsanjani, K. Maslov, H. Krigman, L. Garvey, P. Hu, P. Zhao, K. Meyers, E. Diveley, S. Pizzella, L. Muench, N. Punyamurthy, N. Goldstein, O. Onwumere, M. Alisio, K. Meyenburg, J. Maynard, K. Helm, J. Slaughter, s. Barber, t. Burger, C. Kramer, J. Chubiz, M. Anderson, R. McCarthy, S.K. England, G.A. Macones, Q. Zhou, K.K. Shung, J. Zou, M.J. Stout, M. Tuuli, L.V. Wang. J. Biomed Opt. 23:1-4. doi: 10.1117/1.JBO.23.12.121617, 2018.
387. N. E. Cabrera-Munoz, P. Eliahoo, R. Wodnicki, H. Jung, C. T. Chiu, J. Williams, H. H. Kim, Q. Zhou. K. K. Shung. Forward-looking 30-MHz phased-array transducer for peripheral intravascular imaging, Sensors and Actuators A. Physical: 280: 145-163, 2018.
388. N. E. Cabrera-Munoz, P. Eliahoo, R. Wodnicki, H. Jung, C. T. Chiu, J. A. Williams, H. H. Kim, Q. Zhou, G.Z. Yang, and K. Kirk Shung. Fabrication and Characterization of a Miniaturized 15-MHz Side-Looking Phased-Array Transducer Catheter. IEEE Trans Ultrason Ferroelectr Freq Control. 66:1079-1092, 2019.



389. S. Yeo, C. Yoon, C.-L. Lien, T.-K. Song, and K. K. Shung. Monitoring of Adult Zebrafish Heart Regeneration Using High-Frequency Ultrasound Spectral Doppler and Nakagami Imaging. *Sensors* 19: 4094 doi:10.3390/s19194094, 2019.
390. H.C. Liu, E. J. Gang, H.N. Kim, N. Abdel-Azim, R. Chen, H. Abdel-Azim, K. K. Shung, Y.M. Kim. Integrin Antibody Decreases Deformability of Patient-Derived Pre-B Acute Lymphocytic Leukemia Cells as Measured by High-Frequency Acoustic Tweezers. *J Ultrasound Med* 9999:1–7, 2019
391. H. G. Lim, H. H. Kim, C. Yoon , and K. K. Shung. A One-Sided Acoustic Trap for Cell Immobilization Using 30-MHz Array Transducer. *IEEE Trans Ultrason Ferroelectr Freq Control.* 67:167-172, 2020.
392. N.S. Lee, C.W. Yoon, Q. Wang, S. Moon, K. M. Koo, H. Jung, R. Chen, L. Jiang, G. Lu, A. Fernandez, R.H. Chow, A.C. Weitz, P.M. Salvaterra, F. Pinaud and K.K. Shung. Focused ultrasound stimulates mechanosensitive PANNEXIN-1 to mediate ER calcium oscillations in invasive cancer cells. Submitted to *Nature: Communications* for publication, 2020.

#### *PROCEEDING PAPERS*

1. Shung, K.K. and J.M. Reid. A Substitution Method for the Measurement of Sound Reflection Coefficients for Thin Layers. 1976 IEEE Ultrasonics Symp Proc, pp. 103-107, 1976.
2. Shung, K.K. and J.M. Reid. Ultrasonic Scattering from Tissues. 1977 IEEE Ultrasonics Symp Proc, pp. 230-233, 1977.
3. Shung, K.K. and J.M. Reid. Effect of Hypotonicity Upon the Scattering Properties of Erythrocytes. In Ultrasound in Medicine, Vol. 4, DN White, ed. pp. 567-570, 1978.
4. Fei, D.Y. and K.K. Shung. Ultrasonic Backscatter from Bovine Soft Tissues. 1984 IEEE Ultrasonic Symp Proc., pp. 677-681, 1984.
5. Y.W. Yuan and K.K. Shung: Further Studies of Ultrasonic Backscatter from Blood. 1984 IEEE Ultrasonics Symp Proc., pp. 666-668, 1984.
6. Gunshinan, J.P., J.M. Tarbell, D.B. Geselowitz, G. Rosenberg, K.K. Shung, and W.S. Pierce. Pulsed Doppler Ultrasound Velocity Measurements Inside a Left Ventricular Assist Device", Forum on Unsteady Flows in Biological Systems, the Joint ASCE/ASME Mechanics Conference, pp. 39-42, 1985.
7. Shung, K.K. and D.Y. Fei. The Stochastic Nature of Echoes From Biological Tissues.

- Proc of 7th Annual Conf IEEE Engineering in Medicine and Biology Society, pp. 241-243, 1985.
8. Palmer, B.M., K.K. Shung, F.T.S. Yu. Pseudocolor Encoding of Medical Images with White Light. Proc of the 12th Annual Northeast Bioengineering Conference, pp. 83-86, 1986.
  9. Yuan, Y.W. and K.K. Shung. Fluctuation Rate of Ultrasonic Signals From Blood. 1986 IEEE Ultrasonics Symp Proc, pp. 919-921, 1986.
  10. Yuan, Y.W., K.K. Shung, and W. Dreschel. On the Problems Associated with Focused Transducers in Ultrasonic Attenuation Measurements. Proc of 13th Annual Northeast Bioengineering Conference, University of Pennsylvania, Philadelphia, Pennsylvania, pp. 467-469, 1987.
  11. Shung, K.K. Doppler Ultrasound. Proc of Noise-Con 87 Conference, pp. 763-766, 1987.
  12. Shung, K.K. and L. Pagan-Carlo. A Comparison of Ultrasonic Backscatter of Tissues Measured in Vivo and In Vitro. 1988 IEEE Ultrasonics Symp Proc pp. 801-803, 1989.
  13. Shung, K.K. and B. McGuire. Development of Ultrasonically Marked Needle for Ultrasonically Guided Biopsy. Proc 15th Annual Northeast Bioengineering Conf. pp. 119-120, 1989.
  14. Bleeker, H. and K.K. Shung. Ultrasonic contrast Blood Flowmetry. 1989 IEEE Ultrasonics Symposium Proc pp. 907-909, 1990.
  15. Shung, K.K. Ultrasonic Imaging of Blood:Its Implication on Hemodynamics. 1989 Advances in Bioengineering, pp. 195-196, 1990.
  16. Hete, B., K.K. Shung and D.B. Campbell. Cardiac Allograft Rejection Monitored with Ultrasound Integrated Backscatter. Proc 16th Northeast Bioengineering Conf pp. 41-42, 1990.
  17. Mo, L.Y.L., R.S.C. Cobbold, and K.K. Shung. Common Misconception About the Scattering of Ultrasound by Blood. Proc 12th Annual Conf IEEE Eng Med Biol Soc, pp. 291-292, 1990.
  18. Dreschel, W.R. and K.K. Shung. Rational Attenuation Compensation via Adaptive Digital Filtering. Proc 12th Annual Conf IEEE Eng Med Biol Soc, pp. 293-294, 1990.
  19. Shung, K.K. and C. Lim. The Effect of Hematocrit and Shear Rate on the Doppler

- Spectrum Under Steady and Pulsatile Flow. Proc 12th Annual Conf IEEE Eng Med Biol Soc, pp. 306-307, 1990.
20. Shung, K.K., I.Y. Kuo, R.R. Flenniken and G. Cloutier. Further Studies on Ultrasonic Contrast Blood Flowmetry. 1990 IEEE Ultrasonics Symp Proc, pp. 1545-1548, 1991.
  21. Shung, K.K. and P. Lam. An Ultrasonic Method for Assaying Blood Fibrinogen. Proc 13th Annual Conf IEEE Eng Med Biol Soc, 156-157, 1991.
  22. Hete, B. and Shung, K.K. Using RF Ultrasound to Monitor the Progression of Muscular Dystrophy through Passive Stretching. 1991 IEEE Ultrasonics Symp Proc, PP. 1123-1126, 1992.
  23. Cloutier, G. and Shung, K.K. Cyclic Variation of Doppler Backscattering Power from Porcine Blood in a Pulsatile Flow Model. 1991 IEEE Ultrasonics Symp Proc, pp. 1301-1304, 1992.
  24. Shung, K.K. Recent Advances in Ultrasonic Imaging. Proc. 1992 Modern Engineering and Technology Seminar: Medical Technology(Taiwan), pp. 121-133, 1992.
  25. Cloutier, G. and Shung, K.K. The Effect of Turbulence on the Variation of the Ultrasonic Doppler Amplitude within the Cardiac Cycle. Proc 14th Annual Conf IEEE Eng Med Biol Soc, pp. 2118-2119, 1992.
  26. K.K. Shung, B. Wilson, and R.R. Flenniken. Cardiovascular Application of Ultrasonic Contrast Media. 1992 IEEE Ultrasonics Symposium Proc, pp. 1155-1158, 1992.
  27. P.H. Chang, K.K. Shung, H. Levene and G. Bales. Renal Perfusion Imaging using Contrast Agents. Proc 15th Annual Conf IEEE Eng Med Biol Soc, pp. 216-217, 1993.
  28. P.H. Chang, K.K. Shung. Attenuation and Backscatter Measurements on Alunex<sup>®</sup>. 1993 IEEE Ultrasonics Symposium Proc, pp. 913-916, 1993.
  29. S.J. Wu and K.K. Shung. Variation of Ultrasonic Doppler Power from Blood under Pulsatile Flow. Advances in Bioengineering 1994, pp. 237-238, 1994.
  30. P.H. Chang, K.K. Shung. Second Harmonic Imaging and Harmonic Doppler Measurements with Alunex<sup>®</sup>. 1994 IEEE Ultrasonics Symposium Proc, pp. 1551-1554, 1994.
  31. M.J. Zipparo, K.K. Shung and T.R. Shrout. Piezoelectric Properties of Fine Grain PZT Materials. 1995 IEEE Ultrasonics Symposium Proc., pp601-604, 1995.

32. S.J. Wu, J. Reyner, K.K. Shung and H.F. Routh. A Study on the Feasibility of Using Power Level for Detection of Turbulence and Vessel Differentiation in Doppler Power Imaging. 1995 IEEE Ultrasonics Symposium Proc., pp1527-1530, 1995.
33. S.H. Wang, and K.K. Shung. Backscatter measurements on whole blood using a real-time scanner. 1996 IEEE Ultrasonics Symposium Proc., pp1109-1112, 1996.
34. M.J. Zipparo, K.K. Shung and T.R. Shrout. Piezoceramics for high frequency (50 to 100 MHz) single element imaging transducers. 1996 IEEE Ultrasonics Symposium Proc., pp929-934, 1996.
35. S-E Park, P.D. Lopath, K.K. Shung, and T.R. Shrout. Relaxor based single crystal materials for ultrasonic transducer applications. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3037, pp 140-147, 1997.
36. P.D. Lopath, S.-E. Park, K.K. Shung and T.R. Shrout. Single crystal piezoelectrics for ultrasonic transducers., SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3037, pp 170-174, 1997.
37. K.D. Olbrish and K.K. Shung. Physical apodization of ultrasonic arrays. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3037, pp 196-205, 1997.
38. M.A. Chaterjee and K.K. Shung. Improving the signal to noise ratio of a schlieren system for characterizing ultrasonic transducers.arrays. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3037, pp 189-195, 1997.
39. K.D. Olbrish, M.J. Zipparo, P.D. Lopath, C. Yu, T.R. Shrout, and K.K. Shung. An ultrasound backscatter microscope using PZT, fine grain PZT, and single crystal perovskite transducers. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3037, pp 181-188, 1997.
40. S.H. Wang, Y.H. Lin and K.K. Shung. In vivo measurements of ultrasonic backscatter from blood. 1997 IEEE Ultrasonics Symposium Proc., pp1161-1164, 1997.
41. P.D. Lopath, S. Park, K.K. Shung and T. Shrout. Single crystal PZN-PT in medical ultrasonic transducers. 1997 IEEE Ultrasonics Symposium Proc., pp1643-1646, 1997.
42. M.J. Zipparo, K.K. Shung and T.R. Shrout. Piezoceramics for high frequency (20 to 100 MHz) transducers and arrays. 1997 IEEE Ultrasonics Symposium Proc., pp1663-1667, 1997.
43. D. Vilkomerson, D. Lyons, T. Chilipka, P. Lopath, K.K. Shung. Diffraction grating transducers. 1997 IEEE Ultrasonics Symposium Proc., pp1691-1696, 1997.

44. T.R. Shrout, S-E Park, P.D. Lopath, R. Meyer, T.A. Ritter, K.K. Shung. Innovations in piezoelectric materials for ultrasonic transducers. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3341, pp 174-183, 1998.
45. P.D. Lopath, S.-E. Park, K.K. Shung and T.R. Shrout. Single crystal PZN/PT transducers., SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3341, pp 242-248, 1998.
46. T.A. Ritter,, K.K. Shung, S.-E. Park, X. Geng, and T.R. Shrout. 1-3 single crystal composites for ultrasonic transducers arrays. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3341, pp 243-261, 1998.
47. C. Ristic, D.A. Edwards, K.K. Shung and J.L. Duda. Focused beam convection system. Proc 24th Northeast Bioengineering Conf pp. 91-93, 1998.
48. T.X. Missaridis and K.K. Shung. The effect of hemodynamics, vessel wall elasticity and hematocrit on the ultrasonic Doppler power - an in-vitro study. Proc 24th Northeast Bioengineering Conf pp. 100-103, 1998.
49. T. Ritter, K.K. Shung, X. Geng, H. Wang, and T.R. Shrout. 30 MHz medical imaging arrays incorporating 2-2 composites. 1998 IEEE Ultrasonics Symposium Proc., pp1851-1855, 1998.
50. W.H. Chen and K.K. Shung. The effect of low intensity ultrasound on Optison. 1998 IEEE Ultrasonics Symposium Proc., pp1791-1794, 1998.
51. T.X. Missaridis and K.K. Shung. Cyclic variation of Doppler power as a function of hematocrit and vessel wall compliance. 1998 IEEE Ultrasonics Symposium Proc., pp1533-1537, 1998.
52. D. Vilkomerson, D. Lyons, T. Chilipka, M. Delamere, P. Lopath, P. Palanchon, and K.K. Shung. Clinical blood flow measurements using diffractive grating transducers. 1998 IEEE Ultrasonics Symposium Proc., pp1501-1508, 1998.
53. K.K. Shung. Very high frequency (VHF) ultrasonic imaging. Proc 25th Northeast Bioengineering Conf pp. 107-108, 1999.
54. X. Geng, T.A. Ritter, K.K. Shung. Optimization of 1-3 relaxor PT single crystal/polymer composites. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3664, pp 24-30, 1999.
55. H. Wang, T.A. Ritter, W. Cao and K.K. Shung. Passive materials for high frequency

- ultrasound transducers. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3664, pp 35-43, 1999.
56. P.D. Lopath, R.J. Meyer, S. Ayappan, K.A. Snook, R.A. Ritter, and K.K. Shung. High frequency transducers for ultrasonic backscatter microscopy. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3664, pp 56-66, 1999.
  57. T.A. Ritter, K.K. Shung, X. Geng, P.D. Lopath, R.L. Tutwiler, and T.R. Shrout. Composite ultrasound transducer arrays for operation above 20 MHz. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3664, pp 67-75, 1999.
  58. P. Palanchon, D. Vilkomerson, T. Chilipka, and K.K. Shung. Improved diffractive grating transducers. SPIE Proceedings Ultrasonic Transducer Engineering Vol. 3664, pp 155-160, 1999.
  59. Z.J. Zhao, C. Alves, K.A. Snook, R.J. Meyer, T.A. Ritter and K.K. Shung. Performance of high frequency PZT fiber composite and PVDF transducers. 1999 IEEE Ultrasonics Symposium Proc., pp1185-1190, 1999.
  60. X.C. Geng, T.A. Ritter, and K.K. Shung. 1-3 piezoelectric composites for high power ultrasonic transducer applications. 1999 IEEE Ultrasonics Symposium Proc., pp1191-1194, 1999.
  61. J.M. Cannata, J.Z. Zhao, S. Ayaappan, T.A. Ritter, and K.K. Shung. 1999 IEEE Ultrasonics Symposium Proc., pp1099-1103, 1999.
  62. T.A. Ritter, K.K. Shung, W.S. Hackenberger, and T.R. Shrout. Performance of a new high dielectric constant piezoelectric ceramic. 1999 IEEE Ultrasonics Symposium Proc., pp1295-1298, 1999.
  63. T.A. Ritter, K.K. Shung, R. Tutwiler, and T.R. Shrout. Medical imaging arrays for frequencies high than 25 MHz. 1999 IEEE Ultrasonics Symposium Proc., pp1203-1207, 1999.
  64. J.M. Cannata, W.-H. Chen, T.A. Ritter, K.K. Shung. Fabrication of high frequency single element ultrasonic transducers using lithium niobate. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 3982, pp86-91, 2000.
  65. K.A. Snook, J.-Z. Zhao, C.F. Alves, J.M. Cannata, W.-H. Chen, T.A. Ritter, K.K. Shung. High frequency transducers for medical ultrasonic imaging. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 3982, pp92-99, 2000.
  66. J.-Z. Zhao, R.J. Meyers, Jr., T.A. Ritter, K.K. Shung. Performance of high frequency PZT fiber composite and lead titanate transducers. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 3982, pp100-108, 2000.

67. C.F. Alves, K.A. Snook, T.A. Ritter, K.K. Shung. High frequency single element and annular array transducers incorporating PVDF. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 3982, pp109-115, 2000.
68. Q. Wu, R.L. Tutwiler, K.K. Shung. Design of an analog beamformer for very high frequency ultrasound transducer arrays. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 3982, pp142-151, 2000.
69. T.A. Ritter, K.K. Shung, R.L. Tutwiler, T.R. Shrout. High frequency transducer arrays for medical imaging. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 3982, pp208-216, 2000.
70. J.Z. Zhao, G. Molingou, W.H. Chen, T.A. Ritter and K.K. Shung. High performance, high frequency ultrasound transducers incorporating PbTiO<sub>3</sub>. 2000 IEEE Ultrasonics Symposium Proc., pp973-976, 2000.
71. N.M. Kari, T.A. Ritter, S.E. Park, T.R. Shrout, and K.K. Shung. Investigations of potassium niobate as an ultrasonic transducer material. 2000 IEEE Ultrasonics Symposium Proc., pp1065-1068, 2000.
72. K.A. Snook, B. Huang, N.B. Smith, and K.K. Shung. An exosimetry system for characterization of acoustic fields above 20 MHz. 2000 IEEE Ultrasonics Symposium Proc., pp1109-1112, 2000.
73. J.M. Cannata, T.A. Ritter, W.H. Chen and K.K. Shung. Design of focused single element (50-100 MHz) transducers using lithium niobate. 2000 IEEE Ultrasonics Symposium Proc., pp1129-1133, 2000.
74. T.A. Ritter, K.K. Shung, A. Voie and M. Moehring. Catheter mounted Doppler ultrasound transducers. 2000 IEEE Ultrasonics Symposium Proc., pp1223-1226, 2000.
75. T.A. Ritter, K.K. Shung, J. Cannata and T.R. Shrout. High frequency arrays for medical imaging. 2000 IEEE Ultrasonics Symposium Proc., pp1261-1264, 2000.
76. W.H. Chen, E.J. Gottlieb, J.M. Cannata, Y.F. Chen, and K.K. Shung. Development of sector scanning ultrasonic backscatter microscope. 2000 IEEE Ultrasonics Symposium Proc., pp1681-1684, 2000.
77. J.M. Cannata, T.A. Ritter, W.H. Chen, K.K. Shung. Design of focused single element (50 to 100 MHz) transducers using lithium niobate. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 4325, pp28-35, 2001.
78. T.A. Ritter, T.R. Shrout and K.K. Shung. High frequency synthetic ultrasound array incorporating an actuator. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol.

- 4325, pp36-46, 2001.
79. Y.O. Chen, T.A. Ritter, J. Babarad, K.K. Shung, R.L. Tutwiler, and Q. Wu. Software control architecture of a 48 element 30 MHz linear array. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 4325, pp523-533, 2001.
  80. W.H. Chen, P..J. Cao, E. Maione, T. Ritter, and K.K. Shung. Optimization of pulse transmission in a high frequency ultrasonic imaging system. 2001 IEEE Ultrasonics Symposium Proc., pp995-998, 2001.
  81. S. Rhee, T.A. Ritter, K.K. Shung, H. Wang, and W. Cao. Materials for Acoustic matching in ultrasonic transducers. 2001 IEEE Ultrasonics Symposium Proc., pp1051-1055, 2001.
  82. B. Huang, K. Snook, and K.K. Shung. Characterization of high frequency transducers with small aperture hydrophones. 2001 IEEE Ultrasonics Symposium Proc., pp1069-1071, 2001.
  83. T. A. Ritter, T.R. Shrou, and K.K. Shung. Development of high frequency medical ultrasound arrays. 2001 IEEE Ultrasonics Symposium Proc., pp1127-1133, 2001.
  84. J.M. Cannata, T. Ritter, and K.K. Shung. A 35 MHz linear array for medical imaging. 2001 IEEE Ultrasonics Symposium Proc., pp1157-1160, 2001.
  85. K. Snook, T. Ritter, T.R. Shrou, and K.K. Shung. Design of a high frequency annular array for medical ultrasound. 2001 IEEE Ultrasonics Symposium Proc., pp1161-1164, 2001.
  86. K.K. Shung and D.G. Paeng. Ultrasound: an Unexplored tool for blood flow visualization and hemodynamic measurements. Proc. 1<sup>st</sup> Int. Symp. On Acoustic and Vibration Engineering, Pukyong National Univ. Korea, pp7-12, 2002.
  87. J.P. Stitt, R. Tutwiler and K.K. Shung. An improved four zone high frequency beam former. 2002 IEEE Ultrasonics Symposium Proc., pp599-603, 2002.
  88. J.M. Cannata and K.K. Shung. Development of high frequency (> 20 MHz) linear array using fine grain ceramic elements. 2002 IEEE Ultrasonics Symposium Proc., pp1212-1216, 2002.
  89. W.H. Chen, K. Snook, P.J. Cao, and K.K. Shung. Design and development of a six channel annular array ultrasound backscatter microscope. 2002 IEEE Ultrasonics Symposium Proc., pp603-1607, 2002.
  90. P.J. Cao, K.K. Shung, and W.H. Chen. Design of a high frequency digital beamformer for a 50 MHz annular array. 2002 IEEE Ultrasonics Symposium Proc., pp1578-1582, 2002.
  91. K. Snook, S. Rhee, M. Robert, E. Gottlieb, and K.K. Shung. Development of P(VDF-TRFE) polymer transducers operating in 50-120 MHz. 2002 IEEE Ultrasonics Symposium Proc.,



pp1217-1221, 2002.

92. D.G. Paeng, B. Kim, M. Choi, R.Y. Chao and K.K. Shung. In vivo observation of blood echogenicity variation during a cardiac cycle on human carotid arteries. 2003 IEEE Ultrasonics Symposium Proc. pp847-850, 2003.
93. P.J. Cao, C.H. Hu, and K.K. Shung. Development of a real-time digital; high frequency annular array ultrasonic imaging system. 2003 IEEE Ultrasonics Symposium Proc. pp1867-1870, 2003.
94. J.M. Cannata and K.K. Shung. A comparison of model and experiment for a high frequency (35 MHz) linear ultrasonic array. 2003 IEEE Ultrasonics Symposium Proc. pp1658-1662, 2003.
95. E.J. Gottlieb, W. Chen, P.J. Cao, J. Cannata, K.K. Shung. A method for improved transducer performance from 20 MHz to 100 MHz considering the effects of output impedance of a high frequency pulser. 2003 IEEE Ultrasonics Symposium Proc. pp1646-1649, 2003.
96. R.L. Tutwiler, J.P. Sttit, T.A. Ritter, K.K. Shung, W.S. Hackenberger, X.N. Jiang and P.W. Rehrig. Precision mechanically scanned HF ultrasound arrays. 2003 IEEE Ultrasonics Symposium Proc. pp873-876, 2003.
97. H. Wang, W. Cao, Q. Zhou and K.K. Shung. Characterization of ultra-thin quarter-wavelength matching layers of high frequency ultrasonic transducers. 2003 IEEE Ultrasonics Symposium Proc. pp1048-1051, 2003.
98. Q.F. Zhou, J. Cannata, C.Z. Huang, H.K. Guo, V. Marmaralis, and K.K. Shung. Fabrication and modeling of inversion layer ultrasonic transducers using LiNbO<sub>3</sub> single crystal. 2003 IEEE Ultrasonics Symposium Proc. pp1034-1037, 2003.
99. K.A. Snook, T.R. Shrout and K.K. Shung. Development of high frequency annular arrays for medical imaging. 2003 IEEE Ultrasonics Symposium Proc. pp865-868, 2003.
100. J. Cannata, and K.K. Shung. Development of a high frequency (35 MHz) linear ultrasonic array. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 5373, pp18-23, 2004.
101. B. Huang and K.K. Shung. Characterization of very high frequency transducers with wire targets and hydrophone. Journal of Physics Conference Series Vol. 1 Advanced Metrology for Ultrasound in Medicine, pp161-166, 2004.
102. D.G. Paeng, M.J. Choi, and K.K. Shung. Investigation of blood under pulsatile flow using ultrasound imaging. Proc. Asian Fed. Soc. Ultras. Med. Biol. Annual conf. 99-108, 2004.
103. B. Huang and K.K. Shung. Characterization of very high frequency transducers with target and hydrophone. 2004 IEEE Ultrasonics Symposium Proc. pp1034-1037, 2004.
104. J. Cannata, Q.F. Zhou, and K.K. Shung. Development of a high frequency (35 MHz) linear ultrasonic array using 2-2 composite elements. 2004 IEEE Ultrasonics Symposium Proc. pp894-897,

- 2004.
105. C.H. Hu, K.A. Snook, X.C. Xu, J.T. Yen, K.K. Shung and P.J. Cao. FPGA based digital high frequency beamformers for arrays. 2004 IEEE Ultrasonics Symposium Proc. pp1347-1350, 2004.
  106. Q.F. Zhou, K.K. Shung and Y. Huang. Fabrication of sol-gel modified piezoelectric thick films for high frequency ultrasonic applications. 2004 IEEE Ultrasonics Symposium Proc. pp1958-1962, 2004.
  107. Q.Q. Zhang, F.T. Djuth, Q.F. Zhou and K.K. Shung. High performance piezoelectric films for high frequency MEMS ultrasonic transducers. 2004 IEEE Ultrasonics Symposium Proc. pp1954-1957, 2004.
  108. G.H. Feng, C.C. Sharp, Q.F. Zhou, W. Pang, E.S. Kim, and K.K. Shung. Fabrication of MEMS ZnO dome-shaped diaphragm transducers for high frequency ultrasonic imaging. 2004 IEEE Ultrasonics Symposium Proc. pp1950-1953, 2004.
  109. C.C. Sharp, G.H. Feng, Q.F. Zhou, J.M. Cannata, E.S. kim and K.K. Shung. 200 MHz self-focused ZnO MEMS ultrasonic transducers for biomedical imaging. 2004 IEEE Ultrasonics Symposium Proc. pp1946-1949, 2004.
  110. H.K. Guo, J.M. Cannata, Q.F. Zhou, and K.K. Shung. Fabrication and modeling of broadband ultrasonic transducers using partial composites. 2004 IEEE Ultrasonics Symposium Proc. pp1674-1677, 2004.
  111. E.J. Gottlieb, B. Lai, X.C. Xu, J.M. Cannata, and K.K. Shung. Fabrication of high frequency ultrasonic needle transducers for pulsed wave Doppler. 2004 IEEE Ultrasonics Symposium Proc. pp1926-1929, 2004.
  112. D.N. Stephens, K.K. Shung, J. Cannata, J. Zhao, R. Chia, H. Nguyen, K. Thomenius, A. Dentinger, G. Wildes, X. Chen, M. O'Donnell, R. Lowe, J. Pemberton, G.H. Brush, and D.J. Sahn. Clinical application and technical challenges for intracardiac ultrasound imaging. 2004 IEEE Ultrasonics Symposium Proc. pp772-777, 2004.
  113. E.J. Gottlieb, J. M.Cannata, C.H. Hu and K.K. Shung. High frequency P(VDF-TrFE) copolymer broadband annular array ultrasound transducers using high density flexible circuit interconnect. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 5750, pp47-57, 2005.
  114. J.M. Cannata, J.A. Williams, and K.K. Shung. A kerfless 30 MHz ultrasonic linear array. 2005 IEEE Ultrasonics Symposium Proc. pp109-113, 2005.
  115. E.J. Gottlieb, J.M. Cannata, C.H. Hu, and K.K. Shung. High frequency copolymer ultrasonic annular array fabrication technology. 2005 IEEE Ultrasonics Symposium Proc. pp121-124, 2005.
  116. X.C. Xu, C.H. Hu, L. Sun, J. Yen and K.K. Shung. High frequency high frame rate ultrasound imaging system for small animals with linear arrays. 2005 IEEE Ultrasonics Symposium Proc.

- pp109-113, 2005.
117. E.J. Gottlieb, B. Lai, X.C. Xu, J. Yen, J. Cannata, Q.F. Zhou, P.Han, H. Ameri, T. Ratanapakorn, A. Barnes, M. Humayun, and K.K. Shung. PMN-PT high frequency ultrasound needle transducer for pulsed wave Doppler in the eye. 2005 IEEE Ultrasonics Symposium Proc. pp2227-2230, 2005.
  118. L. Sun, J.M. Cannata, J.A. Johnson, J.T. Yen, C. Feng and K.K. Shung. Development of a high frame rate ultrasonic system for cardiac imaging in small animals. SPIE Proceedings Ultrasonic Imaging and Signal Processing, Vol. 6147, pp6147OR1-7, 2006.
  119. J. Lee and K.K. Shung. Calculation of acoustic radiation forces on a sphere by acoustic tweezer. Proc. of Western Pacific Acoustic Conference, Seoul, Korea, pp164-171, 2006.
  120. K.K. Shung. High frequency ultrasound. Proc. of Western Pacific Acoustic Conference, Seoul, Korea, pp727-785, 2006.
  121. R. Bitton, R. Zemp, M. Li, J. Yen, L.H. Wang and K.K. Shung. Photoacoustic microscopy with a 30 MHz array and receive system. 2006 IEEE Ultrasonics Symposium Proc. pp389-393, 2006.
  122. D.N Stephens, J. Cannata, R. Liu, K.K. Shung, M. O'Donnell and D. Sahn. Forward looking intracardiac imaging catheters for electrophysiology. 2006 IEEE Ultrasonics Symposium Proc. pp702-706, 2006.
  123. X. Xu, Q. Zhou, H. Ameri, E.J. Gottlieb, J. Yen, J.M. Cannata, P. Han, M.S. Humayun and K.K. Shung. High frequency pulse-wave ultrasound Doppler system for biomedical applications with PMN-PT needle transducer and 30 MHz linear array. 2006 IEEE Ultrasonics Symposium Proc. pp2234-2238, 2006.
  124. L. Sun, S. Sangkatumvong, and K.K. Shung. A high resolution digital ultrasound system for imaging of zebrafish. 2006 IEEE Ultrasonics Symposium Proc. pp2202-2206, 2006.
  125. L. Sun, C. Feng, J.M. Cannata, J.A. Johnson, J.T. Yen and K.K. Shung. A real-time high frame rate high frequency ultrasonic system for cardiac imaging in small animals. 2006 IEEE Ultrasonics Symposium Proc. pp2206-2210, 2006.
  126. C. Hu, R. Liu, Q. Zhou, J.M. Cannata, J. Yen, and K.K. Shung. Mismatched-filter design for biphas-coded pulse for high frequency ultrasound imaging. IEEE Ultrasonics Symposium Proc. pp2222-2226, 2006.
  127. J.H. Chang, J.T. Yen, L. Sun and K.K. Shung. Implementation of high frame rate digital scan converter for high frequency ultrasound mechanical sector scanner. 2006 IEEE Ultrasonics Symposium Proc. pp2226-2230, 2006.
  128. H.K. Kim, J.M. Cannata, R. Liu, L. Sun, K.K. Shung, R.H. Silverman, and S. Babar. Dual element transducers for high frequency harmonic imaging. 2006 IEEE Ultrasonics Symposium Proc. pp2325-2329, 2006.

129. Q.F Zhou, J.H. Cha, Y. Huang, W. Cao, J.M. Cannata, and K.K. Shung. Nanocomposite matching layers for high frequency ultrasound transducers. 2006 IEEE Ultrasonics Symposium Proc. pp2365-2369, 2006.
130. J.M. Cannata, J.A. Willaims, Q. Zhou, L. Sun and K.K. Shung. Self-focused ZnO transducer for ultrasonic microscopy. 2007 IEEE Ultrasonics Symposium Proc. PP945-948, 2007.
131. R.B. Liu, H.H. Kim, J.M. Cannata, G.S. Chen and K.K. Shung. Self focused 1-3 composite LiNO<sub>3</sub> single element transducer for HIFU applications. 2007 IEEE Ultrasonics Symposium Proc. PP949-952, 2007.
132. Q.F. Zhou, D. Wu, F. Djuth, C.G. Liu, K.K. Shung. High frequency PZT film micromachined ultrasonic transducer. 2007 IEEE Ultrasonics Symposium Proc. PP1057-1060, 2007.
133. H.H. Kim, J.H. Chang, J.M. Cannata and K.K. Shung. Design of 20 MHz Convex linear array for high frequency ophthalmic imaging. 2007 IEEE Ultrasonics Symposium Proc. PP88-91, 2007.
134. J.H. Chang, J.T. Yen, L. Sun and K.K. Shung. A backend processing system for high frame high frequency B-mode imaging. 2007 IEEE Ultrasonics Symposium Proc. PP331-334, 2007.
135. X. Xu, L. Zhang, L. Sun, J.M. Cannata, and K.K. Shung. High frequency duplex scanner for biomedical applications with 30 MHz linear array. 2007 IEEE Ultrasonics Symposium Proc. PP335-338, 2007.
136. L. Sun, C.C. Lien and K.K. Shung. In vivo imaging of adult zebra fish using high frequency ultrasound. 2007 IEEE Ultrasonics Symposium Proc. PP1500-1503, 2007.
137. C.H. Hu, K.K. Shung and A. Chang. Design of a high frequency linear array imaging system with high frame rate. 2007 IEEE Ultrasonics Symposium Proc. PP1529-1532, 2007.
138. J.W. Lee and K.K. Shung. Design of steep intensity distribution for acoustic tweezer using multiple high frequency transducers. 2007 IEEE Ultrasonics Symposium Proc. PP1685-1688, 2007.
139. J. Zhu, W.W. Cao, Q.F. Zhou and K.K. Shung. Fabrication and characterization of nanocrystal TiO<sub>2</sub>-polymer composite matching layers. 2007 IEEE Ultrasonics Symposium Proc. PP1917-1920, 2007.
140. H. Yu, C.Y. Lee, E.S. Kim, D. Wu, Q.F. Zhou, and K.K. Shung. Half-overtone self-focused acoustic transducers for high frequency applications. 2007 IEEE Ultrasonics Symposium Proc. PP2401-2403, 2007.
141. C.C. Huang, L. Sun, S. Daily, and K.K. Shung. High frequency characterization of human vocal fold tissues. 2007 IEEE Ultrasonics Symposium Proc. PP2515-2518, 2007.
142. D. Wu, R.M. Chen, Q.F. Zhou, D.M. Lin, H.L.W. Chan and K.K. Shung. Lead free piezoelectrics for high frequency ultrasound transducers. 2007 IEEE Ultrasonics Symposium Proc. PP2590-2593,

2007.

143. B.P. Zhu, D.W. Wu, Q.F. Zhou, and K.K. Shung. Lead zirconate titanate thick film with enhanced electrical properties for high frequency transducer applications. 2008 IEEE Ultrasonics Symposium Proc. PP70-73, 2008.
144. Y. Sun, D.N. Stephens, J. Park, Y. Sun, L. Marcu, J.M. Cannata, K.K. Shung. Development of a multi-modal tissue diagnostic system combining high frequency ultrasound and photoacoustic imaging with life time fluorescence spectroscopy. 2008 IEEE Ultrasonics Symposium Proc. PP570-573, 2008.
145. J.M. Cannata, J.A. Williams, C.H. Hu and K.K. Shung. Development of high frequency linear arrays using interdigital bonded composites. 2008 IEEE Ultrasonics Symposium Proc. PP686-671, 2008.
146. J.H. Chang, D.G. Paeng, R. Chen, M. Humayun and K.K. Shung. A Novel scan method using angled high frequency single element needle transducers. 2008 IEEE Ultrasonics Symposium Proc. PP1734-1737, 2008.
147. L. Zhang, X. Xu, C.H. Hu, L. Sun, J.T. Yen, J.M. Cannata, and K.K. Shung. Improved high frequency high frame rate duplex ultrasound linear array imaging system. 2008 IEEE Ultrasonics Symposium Proc. PP1730-1733, 2008.
148. L. Sun, C.C. Lien, Q. Wu, J.H. Chang and K.K. Shung. Longitudinal study of adult zebra fish heart regeneration using high frequency echocardiography. 2008 IEEE Ultrasonics Symposium Proc. PP1738-1741, 2008.
149. C.H. Hu, F. Zheng, Y. Huang, J.M. Cannata, K.K. Shung and P. Sun. Design of a 64 channel digital high frequency linear array ultrasound imaging beamformer on a massively parallel processor array. 2008 IEEE Ultrasonics Symposium Proc. PP1266-1269, 2008.
150. Q.F. Zhou, B.P. Zhu, D.W. Wu, C.H. Hu, J.M. Cannata, J. Tian, P.D. Han, and K.K. Shung. PIN-PMN-PT single crystal high frequency ultrasound transducers for medical applications. 2008 IEEE Ultrasonics Symposium Proc. PP1433-1436, 2008.
151. C.G. Liu, D.W. Wu, Q.F. Zhou, F.T. Djuth and K.K. Shung. High frequency (50\_100MHz) medical ultrasound transducer arrays produced by micromachining bulk PZT materials. 2008 IEEE Ultrasonics Symposium Proc. PP690-693, 2008.
152. R. Chen, D.G. Paeng, N. Matsuoka, H. Ameri, Q.F. Zhou, M. Humayun, and K.K. Shung. Ultrasonic Doppler measurements of blood flow velocity of rabbit retinal vessels with high frequency angled needle transducer. 2008 IEEE Ultrasonics Symposium Proc. PP1607-1610, 2008.
153. D. Wu, Q.F. Zhou, K.K. Shung, C.G. Liu and F.T. Djuth. High frequency

- piezoelectric PZT film micromachined ultrasonic arrays. 2008 IEEE Ultrasonics Symposium Proc. PP1222-1225, 2008.
154. H.C. Yang, J. Yin, C.H. Hu, Q. Zhou, J.M. Cannata, Z.P. Chen, and K.K. Shung. Novel biomedical imaging that combines intravascular ultrasound (IVUS) and optical coherent tomography (OCT). 2008 IEEE Ultrasonics Symposium Proc. PP1769-1772, 2008.
  155. K.K. Shung, J.M. Cannata, Q.F. Zhou, and J. W. Lee. High frequency ultrasound: a new frontier for ultrasound. Proc. of IEEE 2009 Engineering in Medicine and Biology Society Annual conference, PP1953-1955, 2009.
  156. K.K. Shung. Ultrasound: past, present and future. Proc. of 3<sup>rd</sup> International Conference on the Development of Biomedical Engineering in Vietnam 2010, PP10-13, 2010.
  157. J.W. Lee, C.Y. Lee and K.K. Shung. Calibration of acoustic trapping forces by fluid 2009 IEEE Ultrasonics Symposium Proc. PP410-413, 2009.
  158. J.S. Jeong, J.H. Chang, J.M. Cannata and K.K. Shung. Simultaneous therapy and imaging for noninvasive HIFU surgery of prostate tissue. 2009 IEEE Ultrasonics Symposium Proc. PP1008-1012, 2009.
  159. H. H. Kim, J. M. Cannata, J. A. Williams, J. H. Chang, K. K. Shung. Fabrication of 20 MHz Convex Array Transducers for High Frequency Ophthalmic Imaging. 2009 IEEE Ultrasonics Symposium Proc. PP1130-1134, 2009.
  160. Q. F. Zhou, B. P. Zhu, C. H. Hu and K. K. Shung, E. P. Gorzkowski and M. J. Pan. Novel Piezoelectric Ceramic-Polymer Aligned Composites via the Freeze Casting Method for High Frequency Transducer Applications. IEEE Ultrasonics Symposium Proc. PP1707-1711, 2009.
  161. A. Jakob, M. Bender, T. Knoll, R. Lemor, M. Bender, T. Lehnert, M. Koch, M. Veith, Q. Zhou, B. P. Zhu, J. X. Han, K. K. Shung. Comparison of different piezoelectric materials for GHz acoustic microscopy transducers. IEEE Ultrasonics Symposium Proc. PP1722-1726, 2009.
  162. B. P. Zhu, Q. F. Zhou, K. K. Shung, Q. Wei, Y. H. Huang. Sol-gel Derived PMN-PT Thick Film for High Frequency Ultrasound Transducer Applications. IEEE Ultrasonics Symposium Proc. PP2197-2200, 2009.
  163. D.W. Wu, C.G. Liu, Q.F. Zhou, K. K. Shung and F.T. Djuth. High-frequency Micromachined Ultrasonic Annular Arrays. IEEE Ultrasonics Symposium Proc. PP2201-2205, 2009.
  164. J.H. Park, C.H. Hu, D. Wu, Q.F. Zhou and K. K. Shung. Compensation of the Transducer Response for High Frequency Coded Excitation Imaging. IEEE Ultrasonics

Symposium Proc. PP2312-2316, 2009.

165. H. R. Chabok, J. M. Cannata, H. H. Kim, and K. K. Shung. Development of High Frequency Annular Array Ultrasound Transducers using Interdigital Bonded Composites. IEEE Ultrasonics Symposium Proc. PP2708-2712, 2009.
166. S.T. Lau, X. Li, Xiang, X.B. Zhang, Q.F. Zhou, K.K. Shung, H. Ji, W. Ren. High Frequency Ultrasonic Transducer with KNN/BNT 0-3 Composite Active Element. IEEE Ultrasonics Symposium Proc. PP76-79, 2010.
167. D. Stephens, J. Cannata, C..H. Seo, J.S. Jeong, E. Sun, W.W. Cao, A. Nikoozadeh, O Oralkan, A. Delarama, T. Nguyen, A. Dentinger, F. Lin, S. Park, D. Wildes, K. Thomenius, K.K. Shung, K. Shivkumar, A. Mahajan, U. Truong, M. O'Donnell, B. Khuri-Yakub, D. Sahn. Ultrasound Compatible RF Ablation Electrode Design for Catheter Based Guidance of RF Ablation - In Vivo Results with Thermal Strain Imaging. IEEE Ultrasonics Symposium Proc. PP229-232, 2010.
168. C.G. Liu, F. Djuth, C.H. Hu, R. Chen, X. Zhang, X. Li, Q.F. Zhou, K.K. Shung. Micromachined High-Frequency PMN-PT/Epoxy 1-3 Composite Ultrasonic Annular Arrays. IEEE Ultrasonics Symposium Proc. PP658-661, 2010.
169. H. Chabok, C. Zhou, S. Alagha, Y. Chen, Q.F. Zhou, K.K. Shung. Development of a Digital Micro-Manufacturing Process for High Frequency Ultrasound Transducers. IEEE Ultrasonics Symposium Proc. PP666-669, 2010.
170. X. Li, J. Yin, C.H. Hu, Q.F. Zhou, K.K. Shung, Z.P. Chen. High-Resolution Co-Registered Intravascular Imaging with Integrated High Frequency Ultrasound and OCT Probe. IEEE Ultrasonics Symposium Proc. PP1506-1509, 2010.
171. C.Y. Lee, J.W. Lee, S.T. Lau, Q.F. Zhou, K.K. Shung. Single Microparticle Manipulation by an Ultrasound Microbeam. IEEE Ultrasonics Symposium Proc. PP849-852, 2010.
172. D. Vilkomerson, T. Chilipka, B. Thomas. H.C. Yang, K.K. Shung, J. Cannata. A New Device for Intra-Vascular Blood Flow Measurement: The Helical Diffraction-Grating Transducer. IEEE Ultrasonics Symposium Proc. PP1096-1099, 2010.
173. D.K.H. Cheung, H.C.T. Chiu, L.Q. Zhang, C.H. Hu, K.K. Shung, A.C.H. Yu. Adaptive Clutter Filter Design for Micro-Ultrasound Color Flow Imaging of Small Blood Vessels. IEEE Ultrasonics Symposium Proc. PP1206-1209, 2010.
174. Y.Yu, C.L. Lien, K.K. Shung, L. Sun. Cardiac Parameters Analysis for Zebrafish Heart Regeneration Based on High Frequency Ultrasound Imaging. IEEE Ultrasonics Symposium Proc. PP1665-1668, 2010.
175. C.S. Liu, H.K. Chiang, C.K. Ting, R.M. Chen, Q.F. Zhou, K.K. Shung. A 40 MHz

- High Frequency Ultrasound Embedded Epidural Needle for Assisting Epidural Access in Pig Study. IEEE Ultrasonics Symposium Proc. PP1803-1806, 2010.
176. J.H. Park, C.H. Hu, K.K. Shung. Linear Power Amplifier for High Frequency Ultrasound Coded Excitation Imaging. IEEE Ultrasonics Symposium Proc. PP1809-1812, 2010.
  177. C.H. Hu, Fan, Zheng; Zhang, Lequan; Jiang, Xiaoning; Snook, Kevin; Yu, Liang; Hackenberger, Wesley; Liu, Ruibin; Geng, Xuecang; Shung, K. K. Development of a Digital 35MHz, 64-Channel Phased Ultrasound Array Imaging System for NDT Applications. IEEE Ultrasonics Symposium Proc. PP1829-1832, 2010.
  178. H. Choi, X. Li, S.T. Lau, C.H. Hu, Q.F. Zhou, K.K. Shung. Development of Integrated Preamplifier for High Frequency Ultrasonic Transducers. IEEE Ultrasonics Symposium Proc. PP1964-1967, 2010.
  179. L.Zhang, C.H. Hu, J. Yen, K.K. Shung. Design of a 64 Channel Analog Receive Beamformer for High Frequency Linear Arrays. IEEE Ultrasonics Symposium Proc. PP1968-1971, 2010.
  180. C.H. Hu, L. Zhang, J. Cannata, K.K. Shung. Development of a Digital High Frequency Ultrasound Array Imaging System. IEEE Ultrasonics Symposium Proc. PP1972-1975, 2010.
  181. H.C.T. Chiu, L. Zhang, D.K.H. Cheung, C.H. Hu, K.K. Shung, A.C.H. Yu. Design of a Programmable Micro-Ultrasound Research Platform. IEEE Ultrasonics Symposium Proc. PP1980-1983, 2010.
  182. D. Zhou, J.Y. Dai, C. W. H. Chan; J. Wu, H. Cai, H. Luo, S.T. Lau, C.H. Hu, Q.F. Zhou, K.K. Shung. Endoscopic Ultrasound Radial Arrays Fabricated with High-Performance Piezocrystal and Piezocomposite. IEEE Ultrasonics Symposium Proc. PP2068-2071, 2010.
  183. J.S. Jeong, J. Cannata, K.K. Shung. Optimal Suppression of Therapeutic Interference for Real-Time Therapy and Imaging with an Integrated HIFU/Imaging Transducer. IEEE Ultrasonics Symposium Proc. PP2243-2247, 2010.
  184. X. Li, W. Wu, Y. Chung, W.Y. Shih, W.H. Shih, Q.F. Zhou, K.K. Shung. 80 MHz Intravascular Ultrasound (IVUS) Transducer. IEEE Ultrasonics Symposium Proc. PP222-225, 2011.
  185. H. Choi, H.C. Yang, S.T. Lau, Q.F. Zhou, K.K. Shung. Novel Limiter Using Bipolar Power Transistor for High Frequency Ultrasonic Transducer Applications. IEEE Ultrasonics Symposium Proc. PP490-493, 2011.
  186. D. Maresca, K. Jansen, G. Renaud, D. Den, G. van Soest, X. Li, Xiang, Q.F. Zhou,



- J. Cannata, K.K. Shung, A.F.W. van der Steen. Intravascular Ultrasound Chirp Imaging. IEEE Ultrasonics Symposium Proc. PP2110-2113, 2011.
187. J.S. Jeong, J.W. Lee, C.Y. Lee, S.Y. Teh, A. Lee, K.K. Shung. Acoustic Particle Trapping in a Microfluidic Device Using Frequency Modulated Signal. IEEE Ultrasonics Symposium Proc. PP1296-1299, 2011.
188. C.Y. Lee, J.W. Lee, S.Y. Teh, A. Lee, H.H. Kim, K.K. Shung. Real Time Acoustic Sensing of Flowing Microdroplets in a Microfluidic Device. IEEE Ultrasonics Symposium Proc. PP1548-1551, 2011.
189. J.S. Jeong, J. Cannata, K.K. Shung. Extended Necrosis by Using Dual-Curved Therapeutic Transducer for Noninvasive HIFU Surgery. IEEE Ultrasonics Symposium Proc. PP2321-2324, 2011.
190. H.C. Yang, J. Cannata, J. Williams, K.K. Shung. A Study of 1-3 Pseudo-Random Pillar Piezocomposites for Ultrasound Transducers. IEEE Ultrasonics Symposium Proc. PP1743-1746, 2011.
191. C. Liu, F. Djuth, Q.F. Zhou, K.K. Shung. Micromachining Techniques in Developing High Frequency Piezoelectric Composite Ultrasound Array Transducers. IEEE Ultrasonics Symposium Proc. PP1747-1750, 2011.
192. J.H. Park, R. Chen, Q.F. Zhou, K.K. Shung. High Frequency Pulse Inversion Chirp Coded Tissue Harmonic Imaging. IEEE Ultrasonics Symposium Proc. PP2253-2256, 2011.
193. J.W. Lee, C.Y. Lee, H.H. Kim, A. Jakob, R. Lemor, S.Y. Teh, A. Lee, K.K. Shung. Two-Dimensional Cell Trapping by Ultrasound Microbeam. IEEE Ultrasonics Symposium Proc. PP184-187, 2011.
194. C.Y. Lee, T.J. Kim, J.W. Lee, J.Y. Hwang, Y. Wang, K.k. Shung. Ultrasonic Stimulation of Single Bovine Aortic Endothelial Cells at 1GHz. IEEE Ultrasonics Symposium Proc. PP21-23, 2012.
195. H. Choi, H. Jung, H.C. Yang, F. Zheng and K.K. Shung. New Modified Butterworth Van-Dyke Model for High Frequency Ultrasonic Imaging. IEEE Ultrasonics Symposium Proc. PP576-579, 2012.
196. J. Y. Hwang, N. Lee, C.Y. Lee, K.H. Lam, K.H. Kim, Q.F. Zhou, R. Chow and K.K. Shung. High-Frequency Ultrasound Microbeam Induced Calcium Elevations in Cancer Cells: Discrimination Between Invasive and Noninvasive Breast Cancer Cells. IEEE Ultrasonics Symposium Proc. PP596-599, 2012.
197. H Choi, M. Kim and K.K. Shung. New MOSFET-Based Expander for High Frequency Ultrasound Systems. IEEE Ultrasonics Symposium Proc. PP623-626,

- 2012.
198. W. Qiu, Y. Yu, Y. Chen, X. Li, C. Liu, J.Y. Dai, Q.F. Zhou, K.K. Shung, H. Zheng and L. Sun. An Open System for Intravascular Ultrasound Imaging. IEEE Ultrasonics Symposium Proc. PP643-646, 2012.
  199. J.S. Jeong, J.H. Chang, and K.K. Shung. Coded Excitation Technique for Real-Time Simultaneous HIFU Therapy and Imaging. IEEE Ultrasonics Symposium Proc. PP831-834, 2012.
  200. J.S. Jeong, R. Chen, Q.F. Zhou, A. Kashani, M. Humayun and K.K. Shung. Dual-Frequency Acoustic Cavitation for Noninvasively Breaking Down a Cataractous Lens. IEEE Ultrasonics Symposium Proc. PP835-838, 2012.
  201. D. Maresca, G. Renaud, G. van Soest, X. Li, Q.F. Zhou, K.K. Shung, N. de Jong and A.F.W. van der Steen. Two Contrast Detection Sequences for Bandwidth-Limited Intravascular Ultrasound Transducers. IEEE Ultrasonics Symposium Proc. PP1197-1200, 2012.
  202. H.C. Yang, C.T. Chiu, H. Choi, F. Zheng, C.G. Liu, W. Qiu, H.K. Kim and K.K. Shung. Low Cross-Talk Kerfless Annular Array Ultrasound Transducers Using 1-3 Piezocomposites with Pseudo-Random Pillars. IEEE Ultrasonics Symposium Proc. PP1560-1563, 2012.
  203. X. Li, J.W. Li, J. Jing, T. Ma, D. Mohar, A. Raney, S. Mahon, M. Brenner, P. Patel, K.K. Shung, Z.P. Chen and Q.F. Zhou. Integrated IVUS-OCT Catheter for in Vivo Intravascular Imaging. IEEE Ultrasonics Symposium Proc. PP1564-1567, 2012.
  204. B.J. Kim, J.H. Park, H.K. Kim, J. Yen and K.K. Shung. Dual Gate Pulsed Wave Doppler Imaging for Investigating Cardiovascular Dysfunctions. IEEE Ultrasonics Symposium Proc. PP1600-1603, 2012.
  205. F. Zheng, C.T. Chiu, C.H. Hu, H. Choi, Y. Li, K. Snook, Y. Liang, W. Hackenberg, R. Liu, X. Geng, X.N. Chiang and K.K. Shung. Micro Defect Detection on Silicon Carbide Mirror with High Frequency Ultrasound Array Scanning. IEEE Ultrasonics Symposium Proc. PP1902-1905, 2012.
  206. K.H. Lam, Ying Li, C.Y. Lee, Q.F. Zhou, and K.K. Shung. Ultrahigh Frequency Ultrasound Microbeam for Biomedical Applications. IEEE Ultrasonics Symposium Proc. PP1994-1997, 2012.
  207. W. Qiu, Y. Yu, H. Chabok, C. Liu, Q.F. Zhou, K.K. Shung, H. Zheng, and L. Sun. A Flexible Annular Array Imaging Platform for Micro-Ultrasound. IEEE Ultrasonics Symposium Proc. PP2172-2175, 2012.
  208. Z. Xie Z, S.L.Chen,M.L. Fabiilli, J.B. Fowlkes, K.K. Shung, Q. Zhou, X.Wei, P.L.

- Carson, X. Wang. Viewing individual cells and ambient microvacuature using two molecular contrasts. Proc. SPIE Photons Plus Ultrasound: Imaging and Sensing, SPIE, 8581, 85813G 85811-85815, 2013.
209. Y. Li, J.Y. Hwang, K.K. Shung and J.W. Lee. Single beam acoustic tweezer: a new tool for microparticle manipulation. Acoustics Today, 9: 10-13, 2013.
210. K. H. Lam, F. Zheng, Y. Li, Q. Zhou, K. K. Shung. Zebrafish Egg Manipulation Using Ultrasound Microbeam. IEEE Ultrasonics Symposium Proc. PP303-306, 2013.
211. T. Ma, W. Qi, R. Li, Q. Zhou, K. K. Shung, and Z. Chen. Optoacoustic Elastography for Tissue Biomechanical Property Characterization Using a Ring Transducer. IEEE Ultrasonics Symposium Proc. PP1162-1165, 2013.
212. T. Ma, J. Li, J. Jing, X. Li, P. M. Patel, K. K. Shung<sup>1</sup>, Z. Chen and Q. Zhou. Real-time Co-registered IVUS-OCT Catheter for Atherosclerotic Plaque Identification. IEEE Ultrasonics Symposium Proc. PP777-780, 2013.
213. C. Liu, F. Zheng, R.M. Chen, T. Ma, F. Djuth, Q. Zhou, K.K. Shung. Micromachined High-Frequency Ultrasound 2-Dimensional Array Transducer. IEEE Ultrasonics Symposium Proc. PP789-792, 2013.
214. H. Jung, H. Choi, K. K. Shung. Wideband Portable Power Amplifier Design for Very High Frequency Ultrasonic Transducer Applications. IEEE Ultrasonics Symposium Proc. PP1560-1563, 2013.
215. H. Choi, H. Jung, R. Chen, K. K. Shung. Harmonic Distortion Reduction Technique of the Power Amplifier for Very High Frequency Ultrasonic Transducer Applications. IEEE Ultrasonics Symposium Proc. PP1564-1566, 2013.
216. Min. G. Kim, H. Choi, H. H. Kim, K. K. Shung. Bipolar Pulse Generator for Very High Frequency (> 100 MHz) Ultrasound Applications. IEEE Ultrasonics Symposium Proc. PP1567-1570, 2013.
219. C. Jin, Z. Zhang, C. Zhang, Q. Zhou, and K.K. Shung. Fabrication and Characteristics of Inversion Layer LiNbO<sub>3</sub> for High Frequency Ultrasound Transducers. IEEE Ultrasonics Symposium Proc. PP1566-1569, 2014.
220. Y. Li, J. Ma, K. H. Martin, H. Choi, P. A. Dayton, X. Jiang, K. K. Shung, Q. Zhou. A Configurable Dual-Frequency Transmit/Receive System for Acoustic Angiography Imaging. IEEE Ultrasonics Symposium Proc. PP731-734, 2014.
221. C. T. Chiu, J. A. Williams, B. J. Kang, T. Abraham, K. K. Shung, H. H. Kim. Fabrication and Characterization of a 20 MHz Microlinear Phased Array Transducer for Intervention Guidance. IEEE Ultrasonics Symposium Proc. PP2121-2124, 2014.

222. S. Yoon, M. G. Kim, K. K. Shung and Y. Wang. Programmable delivery of macromolecules using high frequency ultrasound. IEEE Ultrasonics Symposium Proc. doi: 10.1109/ULTSYM.2015.0031, 2015.
223. S. Yoon, Y. Wang, K. K. Shung. Optimization of input parameters of acoustic-transfection for the intracellular delivery of macromolecules using FRET-based biosensors. Proc. SPIE 9723, Reporters, Markers, Dyes, Nanoparticles, and Molecular Probes for Biomedical Applications VIII, 97230C doi:10.1117/12.2212691, 2016.