



## Kim Butts Pauly

Professor of Radiology (Radiological Sciences Lab) and, by courtesy, of Electrical Engineering

### Bio

---

#### ACADEMIC APPOINTMENTS

- Professor, Radiology
- Professor (By courtesy), Electrical Engineering
- Member, Bio-X
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

#### ADMINISTRATIVE APPOINTMENTS

- Director, Center for Biomedical Imaging at Stanford, (2010-2015)
- Director, Radiological Sciences Laboratory, (2017- present)

#### HONORS AND AWARDS

- Fellow, ISMRM (2009)
- Distinguished Investigator, The Academy of Radiology Research (2012)
- Fellow, American Institute For Medical and Biological Engineering (2015)

#### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Board Member, ISMRM (2004 - 2008)
- Board Member, ISTU (2009 - 2012)
- Chair, Scientific Program Committee, ISMRM (2007 - 2008)
- Chair, Technical Program Committee, ISTU (2013 - 2014)
- Secretary General, ISTU (2018 - present)

#### PROFESSIONAL EDUCATION

- B.S., Duke University , Physics (1989)
- Ph.D., Mayo Graduate School , Biophysical Sciences (1993)

#### LINKS

- My Webpage: <http://kbplab.stanford.edu/>

## Research & Scholarship

---

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

We are investigating and developing, and applying focused ultrasound in neuromodulation, blood brain barrier opening, and ablation for both neuro and body applications.

Our study of focused ultrasound neuromodulation of deep brain structures includes study of the mechanism and how to monitor/ensure accurate intensities reach the brain. We are studying neuromodulation in both small rodent models and in larger brain models.

We are using focused ultrasound in the presence of microbubbles to open the blood brain barrier in order to enhance drug delivery to cancers of the brain. We are studying how ultrasound modulates the immune system and how that can be directed toward cancer therapy. Engineering efforts are centered around finding the in situ pressure and tissue strain from the radiation force displacement measured on MRI.

We are also using focused ultrasound to thermally ablate tissue for movement disorders such as essential tremor, as well as for cancers in the body. Robust volumetric MR thermometry in the presence of motion and transducers is an ongoing engineering focus.

## Teaching

---

### COURSES

#### 2024-25

- Introduction to Imaging and Image-based Human Anatomy: BIOE 220, BMP 220, RAD 220 (Win)

#### 2023-24

- Introduction to Imaging and Image-based Human Anatomy: BIOE 220, BMP 220, RAD 220 (Win)

#### 2022-23

- Introduction to Imaging and Image-based Human Anatomy: BIOE 220, BMP 220, RAD 220 (Win)

#### 2021-22

- Introduction to Imaging and Image-based Human Anatomy: BIOE 220, RAD 220 (Win)
- Transcranial Ultrasound Neuromodulation: Physics, Neurophysiology, and Applications: BIOE 225, RAD 225 (Aut)

### STANFORD ADVISEES

#### Postdoctoral Faculty Sponsor

Nai Feng Chen

#### Doctoral Dissertation Advisor (AC)

Mihyun Choi

#### Doctoral (Program)

Jeremiah Hess, Julio Oscanoa Aida

### GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Bioengineering (Phd Program)

## Publications

---

### PUBLICATIONS

- **Remote, brain region-specific control of choice behavior with ultrasonic waves** *SCIENCE ADVANCES*  
Kubaneck, J., Brown, J., Ye, P., Pauly, K., Moore, T., Newsome, W.  
2020; 6 (21)
- **Histologic safety of transcranial focused ultrasound neuromodulation and magnetic resonance acoustic radiation force imaging in rhesus macaques and sheep.** *Brain stimulation*  
Gaur, P., Casey, K. M., Kubaneck, J., Li, N., Mohammadjavadi, M., Saenz, Y., Glover, G. H., Bouley, D. M., Pauly, K. B.  
2020; 13 (3): 804–14
- **Elimination of peripheral auditory pathway activation does not affect motor responses from ultrasound neuromodulation.** *Brain stimulation*  
Mohammadjavadi, M., Ye, P. P., Xia, A., Brown, J., Popelka, G., Pauly, K. B.  
2019
- **A rapid beam simulation framework for transcranial focused ultrasound.** *Scientific reports*  
Leung, S. A., Webb, T. D., Bitton, R. R., Ghanouni, P. n., Butts Pauly, K. n.  
2019; 9 (1): 7965
- **Radiation force as a physical mechanism for ultrasonic neurostimulation of the ex vivo retina.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*  
Menz, M. D., Ye, P. n., Firouzi, K. n., Nikoozadeh, A. n., Butts Pauly, K. n., Khuri-Yakub, P. n., Baccus, S. A.  
2019
- **Measurements of the Relationship Between CT Hounsfield Units and Acoustic Velocity and How It Changes With Photon Energy and Reconstruction Method** *IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL*  
Webb, T. D., Leung, S. A., Rosenberg, J., Ghanouni, P., Dahl, J. J., Pelc, N. J., Pauly, K.  
2018; 65 (7): 1111–24
- **Diffusion MRI tractography for improved transcranial MRI-guided focused ultrasound thalamotomy targeting for essential tremor.** *NeuroImage. Clinical*  
Tian, Q., Wintermark, M., Jeffrey Elias, W., Ghanouni, P., Halpern, C. H., Henderson, J. M., Huss, D. S., Goubran, M., Thaler, C., Airan, R., Zeineh, M., Pauly, K. B., McNab, et al  
2018; 19: 572–80
- **Transcranial MRI-Guided Focused Ultrasound: A Review of the Technologic and Neurologic Applications** *AMERICAN JOURNAL OF ROENTGENOLOGY*  
Ghanouni, P., Pauly, K. B., Elias, W. J., Henderson, J., Sheehan, J., Monteith, S., Wintermark, M.  
2015; 205 (1): 150-159
- **Transcranial ultrasound neuromodulation of the thalamic visual pathway in a large animal model and the dose#response relationship with MR#ARFI** *Scientific Reports*  
Mohammadjavadi, M., Ash, R. T., Li, N., Gaur, P., Kubaneck, J., Saenz, Y., Glover, G. H., Popelka, G. R., Norcia, A. M., Butts Pauly, K.  
2022; 12: 19588
- **Remote, brain region-specific control of choice behavior with ultrasonic waves.** *Science advances*  
Kubaneck, J. n., Brown, J. n., Ye, P. n., Pauly, K. B., Moore, T. n., Newsome, W. n.  
2020; 6 (21): eaaz4193
- **Improved Vim targeting for focused ultrasound ablation treatment of essential tremor: A probabilistic and patient-specific approach.** *Human brain mapping*  
Su, J. H., Choi, E. Y., Tourdias, T. n., Saranathan, M. n., Halpern, C. H., Henderson, J. M., Pauly, K. B., Ghanouni, P. n., Rutt, B. K.  
2020
- **MR elastography frequency-dependent and independent parameters demonstrate accelerated decrease of brain stiffness in elder subjects.** *European radiology*  
Lv, H. n., Kurt, M. n., Zeng, N. n., Ozkaya, E. n., Marcuz, F. n., Wu, L. n., Laksari, K. n., Camarillo, D. B., Pauly, K. B., Wang, Z. n., Wintermark, M. n.  
2020

- **Case Report on Deep Brain Stimulation Rescue After Suboptimal MR-Guided Focused Ultrasound Thalamotomy for Essential Tremor: A Tractography-Based Investigation.** *Frontiers in human neuroscience*  
Saluja, S. n., Barbosa, D. A., Parker, J. J., Huang, Y. n., Jensen, M. R., Ngo, V. n., Santini, V. E., Pauly, K. B., Ghanouni, P. n., McNab, J. A., Halpern, C. H.  
2020; 14: 191
- **Prolonged heating in nontargeted tissue during MR-guided focused ultrasound of bone tumors** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Bitton, R. R., Webb, T. D., Pauly, K., Ghanouni, P.  
2019; 50 (5): 1526–33
- **Anatomic and Thermometric Analysis of Cranial Nerve Palsy after Laser Amygdalohippocampotomy for Mesial Temporal Lobe Epilepsy.** *Operative neurosurgery (Hagerstown, Md.)*  
Huang, Y., Leung, S. A., Parker, J. J., Ho, A. L., Wintermark, M., Patel, S. H., Pauly, K. B., Kakusa, B. W., Beres, S. J., Henderson, J. M., Grant, G. A., Halpern, C. H.  
2019
- **Optimization of a Multifrequency Magnetic Resonance Elastography Protocol for the Human Brain** *JOURNAL OF NEUROIMAGING*  
Kurt, M., Wu, L., Laksari, K., Ozkaya, E., Suar, Z. M., Lv, H., Epperson, K., Epperson, K., Sawyer, A. M., Camarillo, D., Pauly, K., Wintermark, M.  
2019; 29 (4): 440–46
- **Elimination of peripheral auditory pathway activation does not affect motor responses from ultrasound neuromodulation** *BRAIN STIMULATION*  
Mohammadjavadi, M., Ye, P., Xia, A., Brown, J., Popelka, G., Pauly, K.  
2019; 12 (4): 901–10
- **Optimization of a Multifrequency Magnetic Resonance Elastography Protocol for the Human Brain.** *Journal of neuroimaging : official journal of the American Society of Neuroimaging*  
Kurt, M., Wu, L., Laksari, K., Ozkaya, E., Suar, Z. M., Lv, H., Epperson, K., Epperson, K., Sawyer, A. M., Camarillo, D., Pauly, K. B., Wintermark, M.  
2019
- **Prolonged Heating in Nontargeted Tissue During MR-guided Focused Ultrasound of Bone Tumors.** *Journal of magnetic resonance imaging : JMIR*  
Bitton, R. R., Webb, T. D., Pauly, K. B., Ghanouni, P.  
2019
- **TESTING DIFFERENT COMBINATIONS OF ACOUSTIC PRESSURE AND DOSES OF QUINOLINIC ACID FOR INDUCTION OF FOCAL NEURON LOSS IN MICE USING TRANSCRANIAL LOW-INTENSITY FOCUSED ULTRASOUND** *ULTRASOUND IN MEDICINE AND BIOLOGY*  
Zhang, Y., Liao, C., Qu, H., Huang, S., Jiang, H., Zhou, H., Abrams, E., Habte, F. G., Yuan, L., Bertram, E. H., Lee, K. S., Pauly, K., Buckmaster, et al  
2019; 45 (1): 129–36
- **Impact of skull density ratio on efficacy and safety of magnetic resonance-guided focused ultrasound treatment of essential tremor.** *Journal of neurosurgery*  
D'Souza, M. n., Chen, K. S., Rosenberg, J. n., Elias, W. J., Eisenberg, H. M., Gwinn, R. n., Taira, T. n., Chang, J. W., Lipsman, N. n., Krishna, V. n., Igase, K. n., Yamada, K. n., Kishima, et al  
2019: 1–6
- **Enhanced microbubble contrast agent oscillation following 250 kHz insonation** *SCIENTIFIC REPORTS*  
Ilovitsh, T., Ilovitsh, A., Foiret, J., Caskey, C. F., Kusunose, J., Fite, B. Z., Zhang, H., Mahakian, L. M., Tam, S., Butts-Pauly, K., Qin, S., Ferrara, K. W.  
2018; 8
- **Enhanced microbubble contrast agent oscillation following 250kHz insonation.** *Scientific reports*  
Ilovitsh, T., Ilovitsh, A., Foiret, J., Caskey, C. F., Kusunose, J., Fite, B. Z., Zhang, H., Mahakian, L. M., Tam, S., Butts-Pauly, K., Qin, S., Ferrara, K. W.  
2018; 8 (1): 16347
- **Testing Different Combinations of Acoustic Pressure and Doses of Quinolinic Acid for Induction of Focal Neuron Loss in Mice Using Transcranial Low-Intensity Focused Ultrasound.** *Ultrasound in medicine & biology*  
Zhang, Y., Liao, C., Qu, H., Huang, S., Jiang, H., Zhou, H., Abrams, E., Habte, F. G., Yuan, L., Bertram, E. H., Lee, K. S., Pauly, K. B., Buckmaster, et al  
2018

- **Brain stiffens post mortem** *JOURNAL OF THE MECHANICAL BEHAVIOR OF BIOMEDICAL MATERIALS*  
Weickenmeier, J., Kurt, M., Ozkaya, E., de Rooij, R., Ovaert, T. C., Ehman, R. L., Pauly, K., Kuhl, E.  
2018; 84: 88–98
- **Hearing out Ultrasound Neuromodulation** *NEURON*  
Airan, R. D., Pauly, K.  
2018; 98 (5): 875–77
- **Hearing out Ultrasound Neuromodulation.** *Neuron*  
Airan, R. D., Butts Pauly, K.  
2018; 98 (5): 875–77
- **A spiral-based volumetric acquisition for MR temperature imaging** *MAGNETIC RESONANCE IN MEDICINE*  
Fielden, S. W., Feng, X., Zhao, L., Miller, G., Geeslin, M., Dallapiazza, R. F., Elias, W., Wintermark, M., Pauly, K., Meyer, C. H.  
2018; 79 (6): 3122–27
- **Brain stiffens post mortem.** *Journal of the mechanical behavior of biomedical materials*  
Weickenmeier, J., Kurt, M., Ozkaya, E., de Rooij, R., Ovaert, T. C., Ehman, R. L., Butts Pauly, K., Kuhl, E.  
2018; 84: 88–98
- **High sensitivity MR acoustic radiation force imaging using transition band balanced steady-state free precession** *MAGNETIC RESONANCE IN MEDICINE*  
Zheng, Y., Marx, M., Miller, G., Pauly, K.  
2018; 79 (3): 1532–37
- **Printed Receive Coils with High Acoustic Transparency for Magnetic Resonance Guided Focused Ultrasound** *SCIENTIFIC REPORTS*  
Corea, J., Ye, P., Seo, D., Butts-Pauly, K., Arias, A., Lustig, M.  
2018; 8: 3392
- **MRI monitoring of focused ultrasound sonications near metallic hardware.** *Magnetic resonance in medicine*  
Weber, H. n., Ghanouni, P. n., Pascal-Tenorio, A. n., Pauly, K. B., Hargreaves, B. A.  
2018; 80 (1): 259–71
- **Diffusion MRI tractography for improved transcranial MRI-guided focused ultrasound thalamotomy targeting for essential tremor** *NEUROIMAGE-CLINICAL*  
Tian, Q., Wintermark, M., Elias, W., Ghanouni, P., Halpern, C. H., Henderson, J. M., Huss, D. S., Goubran, M., Thaler, C., Airan, R., Zeineh, M., Pauly, K., McNab, et al  
2018; 19: 572–80
- **Magnetic resonance elastography of the brain: A comparison between pigs and humans** *JOURNAL OF THE MECHANICAL BEHAVIOR OF BIOMEDICAL MATERIALS*  
Weickenmeier, J., Kurt, M., Ozkaya, E., Wintermark, M., Pauly, K., Kuhl, E.  
2018; 77: 702–10
- **Treatment of Low-Flow Vascular Malformations of the Extremities Using MR-Guided High Intensity Focused Ultrasound: Preliminary Experience** *JOURNAL OF VASCULAR AND INTERVENTIONAL RADIOLOGY*  
Ghanouni, P., Kishore, S., Lungren, M. P., Bitton, R., Chan, L., Avedian, R., Bazzocchi, A., Pauly, K., Napoli, A., Hovsepian, D. M.  
2017; 28 (12): 1739–44
- **Cost-effectiveness of focused ultrasound, radiosurgery, and DBS for essential tremor.** *Movement disorders*  
Ravikumar, V. K., Parker, J. J., Hornbeck, T. S., Santini, V. E., Pauly, K. B., Wintermark, M., Ghanouni, P., Stein, S. C., Halpern, C. H.  
2017
- **MR Thermometry Near Metallic Devices Using Multispectral Imaging** *MAGNETIC RESONANCE IN MEDICINE*  
Weber, H., Taviani, V., Yoon, D., Ghanouni, P., Pauly, K. B., Hargreaves, B. A.  
2017; 77 (3): 1162-1169
- **Magnetic resonance-guided focused ultrasound treatment of extra-abdominal desmoid tumors: a retrospective multicenter study** *EUROPEAN RADIOLOGY*  
Ghanouni, P., Dobrotwir, A., Bazzocchi, A., Bucknor, M., Bitton, R., Rosenberg, J., Telischak, K., Busacca, M., Ferrari, S., Albisinni, U., Walters, S., Gold, G., Ganjoo, et al

2017; 27 (2): 732-740

- **Improved cortical bone specificity in UTE MR Imaging** *MAGNETIC RESONANCE IN MEDICINE*  
Johnson, E. M., Vyas, U., Ghanouni, P., Pauly, K. B., Pauly, J. M.  
2017; 77 (2): 684-695
- **A meta-analysis of palliative treatment of pancreatic cancer with high intensity focused ultrasound.** *Journal of therapeutic ultrasound*  
Dababou, S., Marrocchio, C., Rosenberg, J., Bitton, R., Pauly, K. B., Napoli, A., Hwang, J. H., Ghanouni, P.  
2017; 5: 9-?
- **A 1-MHz 2-D CMUT Array for HIFU Thermal Ablation**  
Yoon, H., Vaithilingam, S., Park, K., Nikoozadeh, A., Firouzi, K., Choe, J., Watkins, R. D., Oguz, H., Kupnik, M., Pauly, K., Khuri-Yakub, P., Fowlkes, J. B., Salgaonkar, et al  
AMER INST PHYSICS.2017
- **Correlation Of p63 Immunohistochemistry With Histology And Contrast Enhanced MRI In Characteristic Lesions Induced By Minimally Invasive Thermal Treatments In A Dog Prostate**  
Pascal, A., Butts-Pauly, K., Plata, J., Sommer, G., Daniel, B., Bouley, D. M., Fowlkes, J. B., Salgaonkar, V. A.  
AMER INST PHYSICS.2017
- **Experimental Investigations of an Endoluminal Ultrasound Applicator for MR-guided Thermal Therapy of Pancreatic Cancer**  
Adams, M., Salgaonkar, V., Jones, P., Plata, J., Chen, H., Pauly, K., Sommer, G., Diederich, C., Fowlkes, J. B., Salgaonkar, V. A.  
AMER INST PHYSICS.2017
- **Transcranial MRI-guided high-intensity focused ultrasound for treatment of essential tremor: A pilot study on the correlation between lesion size, lesion location, thermal dose, and clinical outcome.** *Journal of magnetic resonance imaging : JMIR*  
Federau, C. n., Goubran, M. n., Rosenberg, J. n., Henderson, J. n., Halpern, C. H., Santini, V. n., Wintermark, M. n., Butts Pauly, K. n., Ghanouni, P. n.  
2017
- **Ex Vivo HIFU Experiments Using a 32 x 32-Element CMUT Array** *IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL*  
Yoon, H., Chang, C., Jang, J. H., Bhuyan, A., Choe, J. W., Nikoozadeh, A., Watkins, R. D., Stephens, D. N., Pauly, K. B., Khuri-Yakub, B. T.  
2016; 63 (12): 2150-2158
- **Specialized volumetric thermometry for improved guidance of MRgFUS in brain.** *Magnetic resonance in medicine*  
Marx, M., Ghanouni, P., Butts Pauly, K.  
2016
- **Predicting variation in subject thermal response during transcranial magnetic resonance guided focused ultrasound surgery: Comparison in seventeen subject datasets.** *Medical physics*  
Vyas, U., Ghanouni, P., Halpern, C. H., Elias, J., Pauly, K. B.  
2016; 43 (9): 5170-?
- **Improved MRI thermometry with multiple-echo spirals.** *Magnetic resonance in medicine*  
Marx, M., Butts Pauly, K.  
2016; 76 (3): 747-756
- **A Randomized Trial of Focused Ultrasound Thalamotomy for Essential Tremor.** *New England journal of medicine*  
Elias, W. J., Lipsman, N., Ondo, W. G., Ghanouni, P., Kim, Y. G., Lee, W., Schwartz, M., Hynynen, K., Lozano, A. M., Shah, B. B., Huss, D., Dallapiazza, R. F., Gwinn, et al  
2016; 375 (8): 730-739
- **Correcting Heat-Induced Chemical Shift Distortions in Proton Resonance Frequency-Shift Thermometry** *MAGNETIC RESONANCE IN MEDICINE*  
Gaur, P., Partanen, A., Werner, B., Ghanouni, P., Bitton, R., Pauly, K. B., Grissom, W. A.  
2016; 76 (1): 172-182
- **Correcting heat-induced chemical shift distortions in proton resonance frequency-shift thermometry.** *Magnetic resonance in medicine*  
Gaur, P., Partanen, A., Werner, B., Ghanouni, P., Bitton, R., Butts Pauly, K., Grissom, W. A.  
2016; 76 (1): 172-182

- **FREQUENCY DEPENDENCE OF ULTRASOUND NEUROSTIMULATION IN THE MOUSE BRAIN** *ULTRASOUND IN MEDICINE AND BIOLOGY*  
Ye, P. P., Brown, J. R., Pauly, K. B.  
2016; 42 (7): 1512-1530
- **Endoluminal ultrasound applicators for MR-guided thermal ablation of pancreatic tumors: Preliminary design and evaluation in a porcine pancreas model** *MEDICAL PHYSICS*  
Adams, M. S., Salgaonkar, V. A., Plata-Camargo, J., Jones, P. D., Pascal-Tenorio, A., Chen, H., Bouley, D. M., Sommer, G., Pauly, K. B., Diederich, C. J.  
2016; 43 (7): 4184-4197
- **Magnetic resonance-guided focused ultrasound treatment of extra-abdominal desmoid tumors: a retrospective multicenter study.** *European radiology*  
Ghanouni, P., Dobrotwir, A., Bazzocchi, A., Bucknor, M., Bitton, R., Rosenberg, J., Telischak, K., Busacca, M., Ferrari, S., Albinini, U., Walters, S., Gold, G., Ganjoo, et al  
2016: -?
- **MR thermometry near metallic devices using multispectral imaging.** *Magnetic resonance in medicine*  
Weber, H., Taviani, V., Yoon, D., Ghanouni, P., Pauly, K. B., Hargreaves, B. A.  
2016
- **Improved cortical bone specificity in UTE MR Imaging.** *Magnetic resonance in medicine*  
Johnson, E. M., Vyas, U., Ghanouni, P., Pauly, K. B., Pauly, J. M.  
2016
- **Is MR-guided High-intensity Focused Ultrasound a Feasible Treatment Modality for Desmoid Tumors?** *CLINICAL ORTHOPAEDICS AND RELATED RESEARCH*  
Avedian, R. S., Bitton, R., Gold, G., Butts-Pauly, K., Ghanouni, P.  
2016; 474 (3): 697-704
- **Improving thermal dose accuracy in magnetic resonance-guided focused ultrasound surgery: Long-term thermometry using a prior baseline as a reference.** *Journal of magnetic resonance imaging*  
Bitton, R. R., Webb, T. D., Pauly, K. B., Ghanouni, P.  
2016; 43 (1): 181-189
- **A feasibility study on monitoring the evolution of apparent diffusion coefficient decrease during thermal ablation** *MEDICAL PHYSICS*  
Plata, J. C., Holbrook, A. B., Marx, M., Salgaonkar, V., Jones, P., Pascal-Tenorio, A., Bouley, D., Diederich, C., Sommer, G., Pauly, K. B.  
2015; 42 (9): 5130-5137
- **A feasibility study on monitoring the evolution of apparent diffusion coefficient decrease during thermal ablation.** *Medical physics*  
Plata, J. C., Holbrook, A. B., Marx, M., Salgaonkar, V., Jones, P., Pascal-Tenorio, A., Bouley, D., Diederich, C., Sommer, G., Pauly, K. B.  
2015; 42 (9): 5130-5137
- **Toward Volumetric MR Thermometry With the MASTER Sequence** *IEEE TRANSACTIONS ON MEDICAL IMAGING*  
Marx, M., Plata, J., Pauly, K. B.  
2015; 34 (1): 148-155
- **Dual-Mode Integrated Circuit for Imaging and HIFU With 2-D CMUT Arrays**  
Jang, J., Rasmussen, M., Bhuyan, A., Yoon, H., Moini, A., Chang, C., Watkins, R. D., Choe, J., Nikoozadeh, A., Stephens, D., Oralkan, O., Pauly, K., Khuri-Yakub, et al  
IEEE.2015
- **Autonomous Real-Time Interventional Scan Plane Control With a 3-D Shape-Sensing Needle** *IEEE TRANSACTIONS ON MEDICAL IMAGING*  
Elayaperumal, S., Plata, J. C., Holbrook, A. B., Park, Y., Pauly, K. B., Daniel, B. L., Cutkosky, M. R.  
2014; 33 (11): 2128-2139
- **Localization of ultrasound-induced in vivo neurostimulation in the mouse model.** *Ultrasound in medicine and biology*  
King, R. L., Brown, J. R., Pauly, K. B.  
2014; 40 (7): 1512-1522
- **MR-acoustic radiation force imaging (MR-ARFI) and susceptibility weighted imaging (SWI) to visualize calcifications in ex vivo swine brain.** *Journal of magnetic resonance imaging*

- Bitton, R. R., Pauly, K. R.  
2014; 39 (5): 1294-1300
- **Transcranial phase aberration correction using beam simulations and MR-ARFI.** *Medical physics*  
Vyas, U., Kaye, E., Pauly, K. B.  
2014; 41 (3): 032901-?
  - **Voltage-Based Device Tracking in a 1.5 Tesla MRI During Imaging: Initial Validation in Swine Models** *MAGNETIC RESONANCE IN MEDICINE*  
Schmidt, E. J., Tse, Z. T., Reichlin, T. R., Michaud, G. F., Watkins, R. D., Butts-Pauly, K., Kwong, R. Y., Stevenson, W., Schweitzer, J., Byrd, I., Dumoulin, C. L.  
2014; 71 (3): 1197-1209
  - **Respiration Based Steering for High Intensity Focused Ultrasound Liver Ablation** *MAGNETIC RESONANCE IN MEDICINE*  
Holbrook, A. B., Ghanouni, P., Santos, J. M., Dumoulin, C., Medan, Y., Pauly, K. B.  
2014; 71 (2): 797-806
  - **Respiration based steering for high intensity focused ultrasound liver ablation.** *Magnetic resonance in medicine*  
Holbrook, A. B., Ghanouni, P., Santos, J. M., Dumoulin, C., Medan, Y., Pauly, K. B.  
2014; 71 (2): 797-806
  - **Investigating the Feasibility of Rapid MRI for Image-Guided Motion Management in Lung Cancer Radiotherapy** *BIOMED RESEARCH INTERNATIONAL*  
Sawant, A., Keall, P., Pauly, K. B., Alley, M., Vasawala, S., Loo, B. W., Hinkle, J., Joshi, S.  
2014
  - **Comparison of Temperature Processing Methods for Monitoring Focused Ultrasound Ablation in the Brain** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Rieke, V., Instrella, R., Rosenberg, J., Grissom, W., Werner, B., Martin, E., Pauly, K. B.  
2013; 38 (6): 1462-1471
  - **Quantifying the local tissue volume and composition in individual brains with magnetic resonance imaging** *NATURE MEDICINE*  
Mezer, A., Yeatman, J. D., Stikov, N., Kay, K. N., Cho, N., Dougherty, R. F., Perry, M. L., Parvizi, J., Hua, L. H., Butts-Pauly, K., Wandell, B. A.  
2013; 19 (12): 1667-1672
  - **Improved sleep MRI at 3 tesla in patients with obstructive sleep apnea.** *Journal of magnetic resonance imaging*  
Shin, L. K., Holbrook, A. B., Capasso, R., Kushida, C. A., Powell, N. B., Fischbein, N. J., Pauly, K. B.  
2013; 38 (5): 1261-1266
  - **Applicators for magnetic resonance-guided ultrasonic ablation of benign prostatic hyperplasia.** *Investigative radiology*  
Sommer, G., Pauly, K. B., Holbrook, A., Plata, J., Daniel, B., Bouley, D., Gill, H., Prakash, P., Salgaonkar, V., Jones, P., Diederich, C.  
2013; 48 (6): 387-394
  - **Focal ablation of prostate cancer: four roles for magnetic resonance imaging guidance** *CANADIAN JOURNAL OF UROLOGY*  
Sommer, G., Bouley, D., Gill, H., Daniel, B., Pauly, K. B., Diederich, C.  
2013; 20 (2): 6672-6681
  - **Adapting MRI acoustic radiation force imaging for in vivo human brain focused ultrasound applications** *MAGNETIC RESONANCE IN MEDICINE*  
Kaye, E. A., Pauly, K. B.  
2013; 69 (3): 724-733
  - **Prospective motion correction using tracking coils** *MAGNETIC RESONANCE IN MEDICINE*  
Qin, L., Schmidt, E. J., Tse, Z. T., Santos, J., Hoge, W. S., Tempny-Afdhal, C., Butts-Pauly, K., Dumoulin, C. L.  
2013; 69 (3): 749-759
  - **EFFECTIVE PARAMETERS FOR ULTRASOUND-INDUCED IN VIVO NEUROSTIMULATION** *ULTRASOUND IN MEDICINE AND BIOLOGY*  
King, R. L., Brown, J. R., Newsome, W. T., Pauly, K. B.  
2013; 39 (2): 312-331
  - **A novel approach for global noise reduction in resting-state fMRI: APPLECOR** *NEUROIMAGE*  
Marx, M., Pauly, K. B., Chang, C.



2013; 64: 19-31

- **The road to clinical use of high-intensity focused ultrasound for liver cancer: technical and clinical consensus.** *Journal of therapeutic ultrasound*  
Aubry, J., Pauly, K. B., Moonen, C., Haar, G. t., Ries, M., Salomir, R., Sokka, S., Sekins, K. M., Shapira, Y., Ye, F., Huff-Simonin, H., Eames, M., Hananel, et al  
2013; 1: 13-?
- **Application of Zernike polynomials towards accelerated adaptive focusing of transcranial high intensity focused ultrasound** *MEDICAL PHYSICS*  
Kaye, E. A., Hertzberg, Y., Marx, M., Werner, B., Navon, G., Levoy, M., Pauly, K. B.  
2012; 39 (10): 6254-6263
- **Toward MR-guided high intensity focused ultrasound for presurgical localization: Focused ultrasound lesions in cadaveric breast tissue** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Bitton, R. R., Kaye, E., Dirbas, F. M., Daniel, B. L., Pauly, K. B.  
2012; 35 (5): 1089-1097
- **Rapid HIFU autofocusing using the entire MR-ARFI image** *12th International Symposium on Therapeutic Ultrasound*  
Grissom, W. A., Kaye, E., Pauly, K. B., Zur, Y., Yeo, D., Medan, Y., Davis, C.  
AMER INST PHYSICS.2012: 162-167
- **Ultrashort TE Imaging of Cryotherapy** *EMAGRES*  
Lu, A., Daniel, B. L., Pauly, K.  
2012; 1 (3): 539-50
- **Transcranial Phase Aberration Correction Using Beam Simulations and MR-ARFI** *12th International Symposium on Therapeutic Ultrasound*  
Vyas, U., Kaye, E., Pauly, K. B.  
AMER INST PHYSICS.2012: 185-190
- **MRI of Frozen Tissue Demonstrates a Phase Shift** *MAGNETIC RESONANCE IN MEDICINE*  
Lu, A., Daniel, B. L., Kaye, E., Pauly, K. B.  
2011; 66 (6): 1582-1589
- **MR Imaging-guided Cryoablation for the Treatment of Benign Prostatic Hyperplasia** *JOURNAL OF VASCULAR AND INTERVENTIONAL RADIOLOGY*  
Ghanouni, P., Gill, H., Kaye, E., Pauly, K. B., Daniel, B.  
2011; 22 (10): 1427-1430
- **In vivo MR acoustic radiation force imaging in the porcine liver** *MEDICAL PHYSICS*  
Holbrook, A. B., Ghanouni, P., Santos, J. M., Medan, Y., Pauly, K. B.  
2011; 38 (9): 5081-5089
- **Metal-Induced Artifacts in MRI** *AMERICAN JOURNAL OF ROENTGENOLOGY*  
Hargreaves, B. A., Worters, P. W., Pauly, K. B., Pauly, J. M., Koch, K. M., Gold, G. E.  
2011; 197 (3): 547-555
- **Magnetic resonance guided high-intensity focused ultrasound ablation of musculoskeletal tumors.** *Current orthopaedic practice*  
Avedian, R. S., Gold, G., Ghanouni, P., Pauly, K. B.  
2011; 22 (4): 303-308
- **Magnetic resonance guided high-intensity focused ultrasound ablation of musculoskeletal tumors** *CURRENT ORTHOPAEDIC PRACTICE*  
Avedian, R. S., Gold, G., Ghanouni, P., Pauly, K.  
2011; 22 (4): 303-8
- **Slice Encoding for Metal Artifact Correction With Noise Reduction** *MAGNETIC RESONANCE IN MEDICINE*  
Lu, W., Pauly, K. B., Gold, G. E., Pauly, J. M., Hargreaves, B. A.  
2011; 65 (5): 1352-1357
- **Rapid MR-ARFI Method for Focal Spot Localization During Focused Ultrasound Therapy** *MAGNETIC RESONANCE IN MEDICINE*  
Kaye, E. A., Chen, J., Pauly, K. B.

2011; 65 (3): 738-743

- **MR-Guided Unfocused Ultrasound Disruption of the Rat Blood-Brain Barrier** *10th International Symposium on Therapeutic Ultrasound*  
Townsend, K. A., King, R. L., Zaharchuk, G., Pauly, K. B.  
AMER INST PHYSICS.2011: 356-360
- **Fabrication of CMUT Cells with Gold Center Mass for Higher Output Pressure** *10th International Symposium on Therapeutic Ultrasound*  
Yoon, H., Ho, M., Apte, N., Cristman, P., Vaithilingam, S., Kupnik, M., Butts-Pauly, K., Khuri-Yakub, B. T.  
AMER INST PHYSICS.2011: 183-188
- **Reweighted I(1) Referenceless PRF Shift Thermometry** *MAGNETIC RESONANCE IN MEDICINE*  
Grissom, W. A., Lustig, M., Holbrook, A. B., Rieke, V., Pauly, J. M., Butts-Pauly, K.  
2010; 64 (4): 1068-1077
- **Magnetic Resonance Imaging Near Metal Implants** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Koch, K. M., Hargreaves, B. A., Pauly, K. B., Chen, W., Gold, G. E., King, K. F.  
2010; 32 (4): 773-787
- **Hybrid referenceless and multibaseline subtraction MR thermometry for monitoring thermal therapies in moving organs** *MEDICAL PHYSICS*  
Grissom, W. A., Rieke, V., Holbrook, A. B., Medan, Y., Lustig, M., Santos, J., McConnell, M. V., Pauly, K. B.  
2010; 37 (9): 5014-5026
- **T-2 relaxation times of C-13 metabolites in a rat hepatocellular carcinoma model measured in vivo using C-13-MRS of hyperpolarized [1-C-13]pyruvate** *NMR IN BIOMEDICINE*  
Yen, Y., Le Roux, P., Mayer, D., King, R., Spielman, D., Tropp, J., Pauly, K. B., Pfefferbaum, A., Vasanaawala, S., Hurd, R.  
2010; 23 (4): 414-423
- **Optimization of Encoding Gradients for MR-ARFI** *MAGNETIC RESONANCE IN MEDICINE*  
Chen, J., Watkins, R., Pauly, K. B.  
2010; 63 (4): 1050-1058
- **Accelerated Slice Encoding for Metal Artifact Correction** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Hargreaves, B. A., Chen, W., Lu, W., Alley, M. T., Gold, G. E., Brau, A. C., Pauly, J. M., Pauly, K. B.  
2010; 31 (4): 987-996
- **Consistency of Signal Intensity and T2\*in Frozen Ex Vivo Heart Muscle, Kidney, and Liver Tissue** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Kaye, E. A., Josan, S., Lu, A., Rosenberg, J., Daniel, B. L., Pauly, K. B.  
2010; 31 (3): 719-724
- **Real-Time MR Thermometry for Monitoring HIFU Ablations of the Liver** *MAGNETIC RESONANCE IN MEDICINE*  
Holbrook, A. B., Santos, J. M., Kaye, E., Rieke, V., Pauly, K. B.  
2010; 63 (2): 365-373
- **Clinical feasibility of a magnetic resonance tracking system to guide the position of the scan plane during physiologic joint motion** *RADIOLOGIA MEDICA*  
Vandevenne, J., Pearle, A., Lang, P., Pauly, K. B., Bergman, G.  
2010; 115 (1): 133-140
- **Capacitive Micromachined Ultrasonic Transducers for Therapeutic Ultrasound Applications** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*  
Wong, S. H., Kupnik, M., Watkins, R. D., Butts-Pauly, K., Khuri-Yakub, B. T.  
2010; 57 (1): 114-123
- **Rapid MR-ARFI method for focal spot localization during focused ultrasound treatments** *9th International Symposium on Therapeutic Ultrasound*  
Kaye, E., Chen, J., Pauly, K. B.  
AMER INST PHYSICS.2010: 247-250
- **Effect of the Rat Skull On Focused US, as Measured by MR Thermometry** *9th International Symposium on Therapeutic Ultrasound*

- King, R., Rieke, V., Pauly, K. B.  
AMER INST PHYSICS.2010: 387–390
- **Alternative Focal Spot Geometry for More Efficient HIFU Treatment Assessment** *9th International Symposium on Therapeutic Ultrasound*  
Kaye, E., Chen, J., Medan, Y., Pauly, K. B.  
AMER INST PHYSICS.2010: 256–259
  - **Maximum Linear-Phase Spectral-Spatial Radiofrequency Pulses for Fat-Suppressed Proton Resonance Frequency-Shift MR Thermometry** *MAGNETIC RESONANCE IN MEDICINE*  
Grissom, W. A., Kerr, A. B., Holbrook, A. B., Pauly, J. M., Butts-Pauly, K.  
2009; 62 (5): 1242-1250
  - **A strategy for blood biomarker amplification and localization using ultrasound** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
D'Souza, A. L., Tseng, J. R., Pauly, K. B., Guccione, S., Rosenberg, J., Gambhir, S. S., Glazer, G. M.  
2009; 106 (40): 17152-17157
  - **3.0-T MR-Guided Focused Ultrasound for Preoperative Localization of Nonpalpable Breast Lesions: An Initial Experimental Ex Vivo Study** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Schmitz, A. C., Van den Bosch, M. A., Rieke, V., Dirbas, F. M., Pauly, K. B., Mali, W. P., Daniel, B. L.  
2009; 30 (4): 884-889
  - **SEMAC: Slice Encoding for Metal Artifact Correction in MRI** *16th Annual Meeting of the International-Society-of-Magnetic-Resonance-in-Medicine*  
Lu, W., Pauly, K. B., Gold, G. E., Pauly, J. M., Hargreaves, B. A.  
WILEY-BLACKWELL.2009: 66–76
  - **MRI-Guided Cryoablation: In Vivo Assessment of Focal Canine Prostate Cryolesions** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Josan, S., Bouley, D. M., van den Bosch, M., Daniel, B. L., Pauly, K. B.  
2009; 30 (1): 169-176
  - **Changes in posterior lumbar disk contour abnormality with flexion-extension movement in subjects with low back pain and degenerative disk disease.** *PM & R : the journal of injury, function, and rehabilitation*  
Lee, S., Lee, J., Butts, K., Carragee, E., Fredericson, M.  
2009; 1 (6): 541-546
  - **Changes in Posterior Lumbar Disk Contour Abnormality with Flexion-Extension Movement in Subjects with Low Back Pain and Degenerative Disk Disease** *PM&R*  
Lee, S., Lee, J., Butts, K., Carragee, E., Fredericson, M.  
2009; 1 (6): 541-546
  - **Double Half RF Pulses for Reduced Sensitivity to Eddy Currents in UTE Imaging** *MAGNETIC RESONANCE IN MEDICINE*  
Josan, S., Pauly, J. M., Daniel, B. L., Pauly, K. B.  
2009; 61 (5): 1083-1089
  - **Improved Half RF Slice Selectivity in the Presence of Eddy Currents with Out-of-Slice Saturation** *MAGNETIC RESONANCE IN MEDICINE*  
Josan, S., Kaye, E., Pauly, J. M., Daniel, B. L., Pauly, K. B.  
2009; 61 (5): 1090-1095
  - **MR Imaging-guided Percutaneous Cryoablation of the Prostate in an Animal Model: In Vivo Imaging of Cryoablation-induced Tissue Necrosis with Immediate Histopathologic Correlation** *32nd Annual Meeting of the Society-of-Interventional-Radiology (SIR)*  
van den Bosch, M. A., Josan, S., Bouley, D. M., Chen, J., Gill, H., Rieke, V., Butts-Pauly, K., Daniel, B. L.  
ELSEVIER SCIENCE INC.2009: 252–58
  - **Fast Referenceless PRF Thermometry Using Spatially Saturated, Spatial-spectrally Excited Flyback EPI.** *8th International Symposium on Therapeutic Ultras*  
Holbrook, A. B., Kaye, E., Santos, J. M., Rieke, V., Pauly, K. B.  
AMER INST PHYSICS.2009: 223–227
  - **Optimization of Encoding Gradients for Magnetic Resonance Acoustic Radiation Force Imaging** *8th International Symposium on Therapeutic Ultras*

- Chen, J., Watkins, R., Pauly, K. B.  
AMER INST PHYSICS.2009: 275–278
- **The Feasibility of HIFU Liver Ablation Through the Ribcage and Cartilage in a Rodent Model** *8th International Symposium on Therapeutic Ultras*  
King, R., Rieke, V., Pauly, K. B.  
AMER INST PHYSICS.2009: 149–153
  - **MR-guidance of HIFU Therapy** *Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*  
Pauly, K. B., Rieke, V., Holbrook, A. B., Grissom, W., Chen, J., Kaye, E.  
IEEE.2009: 141–144
  - **Catheter-Based Ultrasound for 3D Control of Thermal Therapy** *8th International Symposium on Therapeutic Ultras*  
Diederich, C., Chen, X., Wootton, J., Juang, T., Nau, W. H., Kinsey, A., Hsu, I., Rieke, V., Pauly, K. B., Sommer, G., Bouley, D.  
AMER INST PHYSICS.2009: 318–322
  - **Progress in Development of HIFU CMUTs for use under MR-guidance** *8th International Symposium on Therapeutic Ultras*  
Wong, S. H., Watkins, R. D., Kupnik, M., Pauly, K. B., Khuri-Yakub, B. T.  
AMER INST PHYSICS.2009: 327–331
  - **REGULARIZED REFERENCELESS TEMPERATURE ESTIMATION IN PRF-SHIFT MR THERMOMETRY** *IEEE International Symposium on Biomedical Imaging - From Nano to Macro*  
Grissom, W., Pauly, K. B., Lustig, M., Rieke, V., Pauly, J., McDannold, N.  
IEEE.2009: 1235–1238
  - **All-in-one magnetic resonance arthrography of the shoulder in a vertically open magnetic resonance unit** *ACTA RADIOLOGICA*  
Vandevenne, J. E., Vanhoenacker, F., Beaulieu, C. F., Bergman, A. G., Pauly, K. B., Dillingham, M. F., Lang, P. K.  
2008; 49 (8): 918-927
  - **Evaluation of wafer bonded CMUTs with rectangular membranes featuring high fill factor** *IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL*  
Wong, S. H., Kupnik, M., Zhuang, X., Lin, D., Butts-Pauly, K., Khuri-Yakub, B. T.  
2008; 55 (9): 2053-2065
  - **Improved slice selection for R2\* mapping during cryoablation with eddy current compensation** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Lu, A., Daniel, B. L., Pauly, J. M., Pauly, K. B.  
2008; 28 (1): 190-198
  - **Monitoring prostate thermal therapy with diffusion-weighted MRI** *MAGNETIC RESONANCE IN MEDICINE*  
Chen, J., Daniel, B. L., Diederich, C. J., Bouley, D. M., Van den Bosch, M. A., Kinsey, A. M., Sommer, G., Pauly, K. B.  
2008; 59 (6): 1365-1372
  - **Transurethral ultrasound applicators with dynamic multi-sector control for prostate thermal therapy: In vivo evaluation under MR guidance** *MEDICAL PHYSICS*  
Kinsey, A. M., Diederich, C. J., Rieke, V., Nau, W. H., Pauly, K. B., Bouley, D., Sommer, G.  
2008; 35 (5): 2081-2093
  - **Feasibility of MR-temperature mapping of ultrasonic heating from a CMUT** *IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL*  
Wong, S. H., Watkins, R. D., Kupnik, M., Pauly, K. B., Khuri-Yakub, B. T.  
2008; 55 (4): 811-818
  - **Echo combination to reduce proton resonance frequency (PRF) thermometry errors from fat** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Rieke, V., Pauly, K. B.  
2008; 27 (3): 673-677
  - **Design, performance, and applications of a hybrid X-Ray/MR system for interventional guidance** *PROCEEDINGS OF THE IEEE*  
Fahrig, R., Ganguly, A., Lillaney, P., Bracken, J., Rowlands, J. A., Wen, Z., Yu, H., Rieke, V., Santos, J. M., Pauly, K. B., Sze, D. Y., Frisoli, J. K., Daniel, et al

2008; 96 (3): 468-480

- **MR thermometry** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Rieke, V., Pauly, K. B.  
2008; 27 (2): 376-390
- **MRI-guided radiofrequency ablation of breast cancer: Preliminary clinical experience** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
van den Bosch, M., Daniel, B., Rieke, V., Butts-Pauly, K., Kermit, E., Jeffrey, S.  
2008; 27 (1): 204-208
- **Catheter-Based Ultrasound Devices and MR Thermal Monitoring for Conformal Prostate Thermal Therapy** *30th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*  
Diederich, C. J., Nau, W. H., Kinsey, A., Ross, T., Wootton, J., Juang, T., Butts-Pauly, K., Rieke, V., Chen, J., Bouley, D. M., Sommer, G.  
IEEE.2008: 3664-3668
- **Progress in CMUTs for HIFU ablation of upper abdominal cancer** *IEEE Ultrasonics Symposium*  
Wong, S. H., Kupnik, M., Khuri-Yakub, B. T., Watkins, R. D., Pauly, K. B.  
IEEE.2008: 2068-2071
- **REDUCTION OF METAL ARTEFACTS IN MUSCULOSKELETAL MR IMAGING** *JBR-BTR*  
Vandevenne, J. E., Vanhoenacker, F. M., Parizel, R. M., Pauly, K. B., Lang, P. K.  
2007; 90 (5): 345-349
- **MRI-guided thermal ablation therapy: Model and parameter estimates to predict cell death from MR thermometry images** *ANNALS OF BIOMEDICAL ENGINEERING*  
Breen, M. S., Breen, M., Butts, K., Chen, L., Saidel, G. M., Wilson, D. L.  
2007; 35 (8): 1391-1403
- **Quantitative evaluation of the relaxivity effects of iodine on Gd-DTPA enhanced MR arthrography** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Ganguly, A., Gold, G. E., Pauly, K. B., Mayer, D., Moseley, M. M., Pelc, N. J., Fahrig, R.  
2007; 25 (6): 1219-1225
- **Referenceless MR thermometry for monitoring thermal ablation in the prostate** *IEEE TRANSACTIONS ON MEDICAL IMAGING*  
Rieke, V., Kinsey, A. M., Ross, A. B., Nau, W. H., Diederich, C. J., Sommer, G., Pauly, K. B.  
2007; 26 (6): 813-821
- **Correlation of contrast-enhanced MR images with the histopathology of minimally invasive thermal and cryoablation cancer treatments in normal dog prostates.** *Proceedings of SPIE--the International Society for Optical Engineering*  
Bouley, D. M., Daniel, B., Pauly, K. B., Liu, E., Kinsey, A., NAU, W., Diederich, C. J., Sommer, G.  
2007; 6440: 644006-?
- **Segmental lumbar mobility in individuals with low back pain: in vivo assessment during manual and self-imposed motion using dynamic MRI** *BMC MUSCULOSKELETAL DISORDERS*  
Kulig, K., Powers, C. M., Landel, R. F., Chen, H., Fredericson, M., Guillet, M., Butts, K.  
2007; 8
- **Design of HIFUCMUT arrays for treatment of liver and renal cancer** *6th International Symposium on Therapeutic Ultrasound*  
Wong, S. H., Ergun, A. S., Yaralioglu, G. G., Oralkan, O., Kupnik, M., Pauly, K. B., Khuri-Yakub, B. T.  
AMER INST PHYSICS.2007: 54-60
- **Prostate thermal therapy with catheter-based ultrasound devices and MR thermal monitoring** *Conference on Thermal Treatment of Tissue - Energy Delivery and Assessment IV*  
Diederich, C. J., Nau, W. H., Kinsey, A., Ross, T., Wootton, J., Juang, T., Butts-Pauly, K., Ricke, V., Liu, E. H., Chen, J., Bouley, D. M., van den Bosch, M., Sommer, et al  
SPIE-INT SOC OPTICAL ENGINEERING.2007
- **Evaluation of thermal and cryo lesions by diffusion-weighted MRI** *Conference on Thermal Treatment of Tissue - Energy Delivery and Assessment IV*  
Chen, J., Daniel, B., Bouley, D., Sommer, G., Butts Pauly, K.  
SPIE-INT SOC OPTICAL ENGINEERING.2007

- **Correlation of contrast-enhanced NM images with the histopathology of minimally invasive thermal and cryoablation cancer treatments in normal dog prostates** *Conference on Thermal Treatment of Tissue - Energy Delivery and Assessment IV*  
Bouley, D. M., Daniel, B., Butts Pauly, K., Liu, E., Kinse, A., NAU, W., Diederich, C. J., Sommer, G.  
SPIE-INT SOC OPTICAL ENGINEERING.2007
- **Advantages of capacitive micromachined ultrasonics transducers (CMUTs) for high intensity focused ultrasound (HIFU)** *IEEE Ultrasonics Symposium*  
Wong, S. H., Kupnik, M., Butts-Pauly, K., Khuri-Yakub, B. T.  
IEEE.2007: 1313–1316
- **Referenceless PRF thermometry with multi-echo processing to monitor prostate ablation** *6th International Symposium on Therapeutic Ultrasound*  
Rieke, V., Kinsey, A. M., Nau, W. H., Diederich, C. J., Sommer, G., Pauly, K. B.  
AMER INST PHYSICS.2007: 272–277
- **Fast conformal thermal ablation in the prostate with transurethral multi-sectored ultrasound devices and MR guidance** *6th International Symposium on Therapeutic Ultrasound*  
Kinsey, A. M., Diederich, C. J., Nau, W. H., Ross, A. B., Pauly, K. B., Rieke, V., Sommer, G.  
AMER INST PHYSICS.2007: 400–404
- **Segmentation of costal cartilage in abdominal CT data using watershed markers** *6th International Symposium on Therapeutic Ultrasound*  
Holbrook, A. B., Pauly, K. B.  
AMER INST PHYSICS.2007: 226–231
- **Magnetic resonance-guided high-intensity ultrasound ablation of the prostate.** *Topics in magnetic resonance imaging*  
Pauly, K. B., Diederich, C. J., Rieke, V., Bouley, D., Chen, J., Nau, W. H., Ross, A. B., Kinsey, A. M., Sommer, G.  
2006; 17 (3): 195-207
- **Multisectored interstitial ultrasound applicators for dynamic angular control of thermal therapy** *MEDICAL PHYSICS*  
Kinsey, A. M., Diederich, C. J., Tyreus, P. D., Nau, W. H., Rieke, V., Pauly, K. B.  
2006; 33 (5): 1352-1363
- **In vivo porcine liver radiofrequency ablation with simultaneous MR temperature imaging** *11th Annual Meeting of the International-Society-for-Magnetic-Resonance-in-Medicine*  
Vigen, K. K., Jarrard, J., Rieke, V., Frisoli, J., Daniel, B. L., Pauly, K. B.  
JOHN WILEY & SONS INC.2006: 578–84
- **Investigation of proton density for measuring tissue temperature** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Chen, J., Daniel, B. L., Pauly, K. B.  
2006; 23 (3): 430–437
- **Dynamic angular control of thermal therapy with stationary multi-sectored tubular ultrasound applicators under MR temperature monitoring** *5th International Symposium on Therapeutic Ultrasound*  
Kinsey, A. M., Diederich, C. J., Nau, W. H., Ross, A. B., Pauly, K. B., Rieke, V., Sommer, G.  
AMER INST PHYSICS.2006: 455–459
- **CAPACITIVE MICROMACHINED ULTRASONIC TRANSDUCERS FOR HIGH INTENSITY FOCUSED ABLATION OF UPPER ABDOMINAL TUMORS** *IEEE Ultrasonics Symposium*  
Wong, S. H., Ergun, A. S., Yaralioglu, G. G., Kupnik, M., Zhuang, X., Oralkan, O., Butts-Pauly, K., Khuri-Yakub, B. T.  
IEEE.2006: 841–844
- **Assessment of MR thermometry during high intensity ultrasound ablation of the canine prostate** *5th International Symposium on Therapeutic Ultrasound*  
Pauly, K. B., Rieke, V., Pisani, L., Sommer, G., Bouley, D., Diederich, C., Ross, A., Nau, W., Kinsey, A., Dumoulin, C., Watkins, R.  
AMER INST PHYSICS.2006: 76–80
- **Targeted prostate thermal therapy with catheter-based ultrasound devices and MR thermal monitoring** *5th International Symposium on Therapeutic Ultrasound*  
Diederich, C., Ross, A., Kinsey, A., Nau, W. H., Rieke, V., Pauly, K. B., Sommer, G.  
AMER INST PHYSICS.2006: 370–374

- **Referenceless MR thermometry during canine prostate ablation** *5th International Symposium on Therapeutic Ultrasound*  
Rieke, V., Ross, A. B., Kinsey, A. M., Nau, W. H., Diederich, C. J., Sommer, G., Pauly, K. B.  
AMER INST PHYSICS.2006: 91-95
- **Truly hybrid x-ray/MR imaging: Toward a streamlined clinical system** *5th International Interventional MRI Symposium*  
Ganguly, A., Wen, Z. F., Daniel, B. L., Butts, K., Kee, S. T., Rieke, V., Do, H. M., Pelc, N. J., Alley, M. T., Fahrig, R.  
ELSEVIER SCIENCE INC.2005: 1167-77
- **In vivo MR thermometry of frozen tissue using R2\* and signal intensity** *5th International Interventional MRI Symposium*  
Wansapura, J. P., Daniel, B. L., Vigen, K. K., Butts, K.  
ELSEVIER SCIENCE INC.2005: 1080-84
- **Effects of spatial and temporal resolution for MR image-guided thermal ablation of prostate with transurethral ultrasound** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Pisani, L. J., Ross, A. B., Diederich, C. J., Nau, W. H., Sommer, F. G., Glover, G. H., Butts, K.  
2005; 22 (1): 109-118
- **Curvilinear transurethral ultrasound applicator for selective prostate thermal therapy** *MEDICAL PHYSICS*  
Ross, A. B., Diederich, C. J., Nau, W. H., Rieke, V., Butts, R. K., Sommer, G., Gill, H., Bouley, D. M.  
2005; 32 (6): 1555-1565
- **X-ray compatible radiofrequency coil for magnetic resonance imaging** *MAGNETIC RESONANCE IN MEDICINE*  
Rieke, V., GANGULY, A., Daniel, B. L., Scott, G., Pauly, J. M., Fahrig, R., Pelc, N. J., Butts, K.  
2005; 53 (6): 1409-1414
- **MRI-guided interstitial ultrasound thermal therapy of the prostate: A feasibility study in the canine model** *MEDICAL PHYSICS*  
Nau, W. H., Diederich, C. J., Ross, A. B., Butts, K., Rieke, V., Bouley, D. M., Gill, H., Daniel, B., Sommer, G.  
2005; 32 (3): 733-743
- **MR-guided transjugular intrahepatic portosystemic shunt creation with use of a hybrid radiography/MR system** *29th Annual Meeting of the Society-of-Interventional-Radiology (SIR)*  
Kee, S. T., GANGULY, A., Daniel, B. L., Wen, Z. F., Butts, K., Shimikawa, A., Pelc, N. J., Fahrig, R., Dake, M. D.  
ELSEVIER SCIENCE INC.2005: 227-34
- **Reduction of blurring in view angle tilting MRI** *MAGNETIC RESONANCE IN MEDICINE*  
Butts, K., Pauly, J. M., Gold, G. E.  
2005; 53 (2): 418-424
- **Biothermal modeling of transurethral ultrasound applicators for MR-guided prostate thermal therapy** *Conference on Treatment of Tissue: Energy Delivery and Assessment III*  
Ross, A. B., Diederich, C. J., Nau, W. H., Tyreus, D., Gill, H., Bouley, D., Butts, R. K., Rieke, V., Daniel, B., Sommer, G.  
SPIE-INT SOC OPTICAL ENGINEERING.2005: 220-227
- **The effect of axial loading and spine position on intervertebral disc hydration: An in vivo pilot study** *JOURNAL OF BACK AND MUSCULOSKELETAL REHABILITATION*  
Lee, S. U., Fredericson, M., Butts, K., Lang, P.  
2005; 18 (1-2): 15-20
- **Catheter-based ultrasound applicators for selective thermal ablation: progress towards MRI-guided applications in prostate** *INTERNATIONAL JOURNAL OF HYPERTHERMIA*  
Diederich, C. J., Nau, W. H., Ross, A. B., Tyreus, P. D., Butts, K., Rieke, V., Sommer, G.  
2004; 20 (7): 739-756
- **Referenceless PRF shift thermometry** *MAGNETIC RESONANCE IN MEDICINE*  
Rieke, V., Vigen, K. K., Sommer, G., Daniel, B. L., Pauly, J. M., Butts, K.  
2004; 51 (6): 1223-1231
- **Highly directional transurethral ultrasound applicators with rotational control for MRI-guided prostatic thermal therapy** *PHYSICS IN MEDICINE AND BIOLOGY*  
Ross, A. B., Diederich, C. J., Nau, W. H., Gill, H., Bouley, D. M., Daniel, B., Rieke, V., Butts, R. K., Sommer, G.



2004; 49 (2): 189-204

- **MRI-temperature mapping during ultrasound prostate ablation using fat for phase estimation.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*  
Rieke, V., Ross, A. B., Nau, W. H., Diederich, C. J., Sommer, G., Butts, K.  
2004; 4: 2500-2502
- **MRI-temperature mapping during ultrasound prostate ablation using fat for phase estimation** *PROCEEDINGS OF THE 26TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY, VOLS 1-7*  
Rieke, V., Ross, A. B., Nau, W. H., Diederich, C. J., Sommer, G., Butts, K.  
2004; 26: 2500-2502
- **Triggered, navigated, multi-baseline method for proton resonance frequency temperature mapping with respiratory motion** *MAGNETIC RESONANCE IN MEDICINE*  
Vigen, K. K., Daniel, B. L., Pauly, J. M., Butts, K.  
2003; 50 (5): 1003-1010
- **First use of a truly-hybrid X-ray/MR imaging system for guidance of brain biopsy** *ACTA NEUROCHIRURGICA*  
Fahrig, R., Heit, G., Wen, Z., Daniel, B. L., Butts, K., Pelc, N. J.  
2003; 145 (11): 995-997
- **Pair of resonant fiducial markers for localization of endovascular catheters at all catheter orientations** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Kuehne, T., Fahrig, R., Butts, K.  
2003; 17 (5): 620-624
- **Diffusion-weighted MRI after cryosurgery of the canine prostate. Magnetic resonance imaging.** *Journal of magnetic resonance imaging : JMIRI*  
Butts, K., Daniel, B. L., Chen, L., Bouley, D. M., Wansapura, J., Maier, S. E., Dumoulin, C., Watkins, R.  
2003; 17 (1): 131-135
- **Diffusion-weighted MRI after cryosurgery of the canine prostate** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Butts, K., Daniel, B. L., Chen, L. L., Bouley, D. M., Wansapura, J., Maier, S. E., Dumoulin, C., Watkins, R.  
2003; 17 (1): 131-135
- **Line scan diffusion imaging of the spine** *AMERICAN JOURNAL OF NEURORADIOLOGY*  
Bammer, R., Herneth, A. M., Maier, S. E., Butts, K., Prokesch, R. W., Do, H. M., Atlas, S. W., Moseley, M. E.  
2003; 24 (1): 5-12
- **Dynamic magnetic resonance guided treatment of developmental dysplasia of the hip** *JOURNAL OF PEDIATRIC ORTHOPAEDICS-PART B*  
Lincoln, T. L., Vandevenne, J. E., Rinsky, L. A., Butts, K., Lang, P.  
2002; 11 (4): 279-283
- **Study of laser ablation in the in vivo rabbit brain with MR thermometry** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Chen, L. L., Wansapura, J. P., Heit, G., Butts, K.  
2002; 16 (2): 147-152
- **Truly hybrid interventional MR/x-ray system: Investigation of in vivo applications** *ACADEMIC RADIOLOGY*  
Fahrig, R., Butts, K., Wen, Z. F., Saunders, R., Kee, S. T., Sze, D. Y., Daniel, B. L., Laerum, F., Pelc, N. J.  
2001; 8 (12): 1200-1207
- **Temperature mapping of frozen tissue using eddy current compensated half excitation RF pulses** *MAGNETIC RESONANCE IN MEDICINE*  
Wansapura, J. P., Daniel, B. L., Pauly, J., Butts, K.  
2001; 46 (5): 985-992
- **Freehand iMRI-guided large-gauge core needle biopsy: A new minimally invasive technique for diagnosis of enhancing breast lesions** *7th Annual Meeting of the International-Society-for-Magnetic-Resonance-in-Medicine (ISMRM)*  
Daniel, B. L., Birdwell, R. L., Butts, K., Nowels, K. W., Ikeda, D. M., Heiss, S. G., Cooper, C. R., Jeffrey, S. S., Dirbas, F. M., Herfkens, R. J.  
JOHN WILEY & SONS INC.2001: 896-902
- **Dynamic MR imaging and stress testing in glenohumeral instability: Comparison with normal shoulders and clinical/surgical findings** *JOURNAL OF MAGNETIC RESONANCE IMAGING*



- Hodge, D. K., Beaulieu, C. F., Thabit, G. H., Gold, G. E., Bergman, A. G., Butts, R. K., Dillingham, M. F., Herfkens, R. J.  
2001; 13 (5): 748-756
- **A truly hybrid interventional MR/X-ray system: Feasibility demonstration** *8th Annual Meeting of the ISMRM*  
Fahrig, R., Butts, K., Rowlands, J. A., Saunders, R., Stanton, J., Stevens, G. M., Daniel, B. L., Wen, Z. F., Ergun, D. L., Pelc, N. J.  
JOHN WILEY & SONS INC.2001: 294–300
  - **Temperature quantitation and mapping of frozen tissue** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Butts, K., Sinclair, J., Daniel, B. L., Wansapura, J., Pauly, J. M.  
2001; 13 (1): 99-104
  - **MRI study of immediate cell viability in focused ultrasound lesions in the rabbit brain** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Chen, L., Bouley, D. M., Harris, B. T., Butts, K.  
2001; 13 (1): 23-30
  - **Changes in posterior disc bulging and intervertebral foraminal size associated with flexion-extension movement: a comparison between L4-5 and L5-S1 levels in normal subjects.** *spine journal*  
Fredericson, M., Lee, S. U., Welsh, J., Butts, K., Norbash, A., Carragee, E. J.  
2001; 1 (1): 10-17
  - **The use of view angle tilting to reduce distortions in magnetic resonance imaging of cryosurgery** *MAGNETIC RESONANCE IMAGING*  
Daniel, B. L., Butts, K.  
2000; 18 (3): 281-286
  - **Glenohumeral relationships during physiologic shoulder motion and stress testing: Initial experience with open MR imaging and active imaging-plane registration** *RADIOLOGY*  
Beaulieu, C. F., Hodge, D. K., Bergman, A. G., Butts, K., Daniel, B. L., Napper, C. L., Darrow, R. D., Dumoulin, C. L., Herfkens, R. J.  
1999; 212 (3): 699-705
  - **Study of focused ultrasound tissue damage using MRI and histology** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Chen, L., Bouley, D., Yuh, E., D'Arceuil, H., Butts, K.  
1999; 10 (2): 146-153
  - **Joint motion in an open MR unit using MR tracking** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Pearle, A. D., Daniel, B. L., Bergman, A. G., Beaulieu, C. F., Lang, P., Dumoulin, C. L., Darrow, R. D., Norbash, A. M., Napper, C. L., Hurtak, W., Butts, K.  
1999; 10 (1): 8-14
  - **1999 Gary J. Becker Young Investigator Award. MR-guided transjugular portosystemic shunt placement in a swine model.** *Journal of vascular and interventional radiology*  
Kee, S. T., Rhee, J. S., Butts, K., Daniel, B., Pauly, J., Kerr, A., O'Sullivan, G. J., Sze, D. Y., Razavi, M. K., Semba, C. P., Herfkens, R. J., Dake, M. D.  
1999; 10 (5): 529-535
  - **MR-guided transjugular portosystemic shunt placement in a swine model** *JOURNAL OF VASCULAR AND INTERVENTIONAL RADIOLOGY*  
Kee, S. T., Rhee, J. S., Butts, K., Daniel, B., Pauly, J., Kerr, A., O'Sullivan, G. J., Sze, D. Y., Razavi, M. K., Semba, C. P., Herfkens, R. J., Dake, M. D.  
1999; 10 (5): 529-535
  - **Management of biopsy needle artifacts: Techniques for RF-refocused MRI** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Butts, K., Pauly, J. M., Daniel, B. L., Kee, S., Norbash, A. M.  
1999; 9 (4): 586-595
  - **Magnetic resonance imaging of frozen tissues: Temperature-dependent MR signal characteristics and relevance for MR monitoring of cryosurgery** *MAGNETIC RESONANCE IN MEDICINE*  
Daniel, B. L., Butts, K., Block, W. F.  
1999; 41 (3): 627-630
  - **Magnetic resonance imaging of knee cartilage repair.** *Topics in magnetic resonance imaging*  
Gold, G. E., Bergman, A. G., Pauly, J. M., Lang, P., Butts, R. K., Beaulieu, C. F., Hargreaves, B., Frank, L., Boutin, R. D., Macovski, A., Resnick, D.  
1998; 9 (6): 377-392
  - **Breast cancer: Gadolinium-enhanced MR imaging with a 0.5-T open imager and three-point Dixon technique** *RADIOLOGY*

- Daniel, B. L., Butts, K., Glover, G. H., Cooper, C., Herfkens, R. J.  
1998; 207 (1): 183-190
- **Isotropic diffusion-weighted and spiral-navigated interleaved EPI for routine imaging of acute stroke** *MAGNETIC RESONANCE IN MEDICINE*  
Butts, K., Pauly, J., deCrespigny, A., Moseley, M.  
1997; 38 (5): 741-749
  - **Diffusion-weighted interleaved echo-planar imaging with a pair of orthogonal navigator echoes** *MAGNETIC RESONANCE IN MEDICINE*  
Butts, K., deCrespigny, A., Pauly, J. M., Moseley, M.  
1996; 35 (5): 763-770
  - **Clinical aspects of DWI** *NMR IN BIOMEDICINE*  
Moseley, M. E., Butts, K., Yenari, M. A., Marks, M., deCrespigny, A.  
1995; 8 (7-8): 387-396
  - **MR-IMAGING OF THE ABDOMEN WITH A PHASED-ARRAY MULTICOIL - PROSPECTIVE CLINICAL-EVALUATION** *80th RSNA Scientific Assembly*  
Campeau, N. G., Johnson, C. D., Felmlee, J. P., Rydberg, J. N., Butts, R. K., Ehman, R. L., Riederer, S. J.  
RADIOLOGICAL SOC NORTH AMERICA.1995: 769-76
  - **DUAL-ECHO INTERLEAVED ECHO-PLANAR IMAGING OF THE BRAIN** *MAGNETIC RESONANCE IN MEDICINE*  
Slavin, G. S., Butts, K., Rydberg, J. N., Jack, C. R., Riederer, S. J.  
1995; 33 (2): 264-270
  - **THE EFFECT OF RESPIRATION ON THE CONTRAST AND SHARPNESS OF LIVER-LESIONS IN MRI** *MAGNETIC RESONANCE IN MEDICINE*  
Butts, K., Riederer, S. J., Ehman, R. L.  
1995; 33 (1): 1-7
  - **IMAGING OF CEREBRAL ACTIVATION AT 1.5-T - OPTIMIZING A TECHNIQUE FOR CONVENTIONAL HARDWARE** *RADIOLOGY*  
Thompson, R. M., Jack, C. R., Butts, K., Hanson, D. P., Riederer, S. J., Ehman, R. L., HYNES, R. W., Hangiandreou, N. J.  
1994; 190 (3): 873-877
  - **SENSORY-MOTOR CORTEX - CORRELATION OF PRESURGICAL MAPPING WITH FUNCTIONAL MR-IMAGING AND INVASIVE CORTICAL MAPPING** *RADIOLOGY*  
Jack, C. R., Thompson, R. M., Butts, R. K., Sharbrough, F. W., Kelly, P. J., Hanson, D. P., Riederer, S. J., Ehman, R. L., Hangiandreou, N. J., Cascino, G. D.  
1994; 190 (1): 85-92
  - **INTERLEAVED ECHO-PLANAR IMAGING ON A STANDARD MRI SYSTEM** *MAGNETIC RESONANCE IN MEDICINE*  
Butts, K., Riederer, S. J., Ehman, R. L., Thompson, R. M., Jack, C. R.  
1994; 31 (1): 67-72
  - **ECHO-PLANAR IMAGING OF THE LIVER WITH A STANDARD MR-IMAGING SYSTEM** *RADIOLOGY*  
Butts, K., Riederer, S. J., Ehman, R. L., Felmlee, J. P., Grimm, R. C.  
1993; 189 (1): 259-264
  - **PHASE-VELOCITY MAPPING WITH A REAL-TIME LINE SCAN TECHNIQUE** *MAGNETIC RESONANCE IN MEDICINE*  
Butts, K., Hangiandreou, N. J., Riederer, S. J.  
1993; 29 (1): 134-138
  - **ANALYSIS OF FLOW EFFECTS IN ECHO-PLANAR IMAGING** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Butts, K., Riederer, S. J.  
1992; 2 (3): 285-293
  - **T2-WEIGHTED SPIN-ECHO PULSE SEQUENCE WITH VARIABLE REPETITION AND ECHO TIMES FOR REDUCTION OF MR IMAGE ACQUISITION TIME** *RADIOLOGY*  
Butts, R. K., Farzaneh, F., Riederer, S. J., Rydberg, J. N., Grimm, R. C.  
1991; 180 (2): 551-556