

CV – J. Thomas Vaughan, Jr.

Date: November, 2019

Personal data:

John Thomas Vaughan, Jr.
June 1, 1957
Columbus, GA
USA

Education:

1982 BS Biology; Auburn University, Auburn, AL
1982 BS Electrical Engineering; Auburn University, Auburn, AL
1993 PhD Biomedical Engineering; University of Alabama at Birmingham,
Birmingham, AL

Professional organizations and societies:

Institute of Electrical and Electronics Engineers (IEEE), Fellow
International Society for Magnetic Resonance in Medicine (ISMRM), Fellow
Radiological Society of North America, Full Member
Biomedical Engineering Society (BMES), Full Member

Academic appointments:

1994 – 1995 Assistant Professor in Biomedical Engineering, University of Alabama at
Birmingham, Birmingham, AL
1995 – 1999 Assistant Professor in Radiology, Harvard Medical School, Boston, MA
1999 – 2001 Assistant Professor in Radiology, On-Leave, Harvard Medical School,
Boston, MA
1999 – 2016 Professor in Radiology, Medical School, University of Minnesota,
Minneapolis, MN
1999 – 2016 Professor in Electrical and Computer Engineering, College of Science
and Engineering, University of Minnesota, Minneapolis, MN
1999 – 2016 Professor in Biomedical Engineering, College of Science and Engineering,
University of Minnesota, Minneapolis, MN
2015 – 2016 Lillian Quist–Joyce Henline Chair in Biomedical Research, University of
Minnesota, Minneapolis, MN
2016 – Adjunct Professor in Radiology, University of Minnesota, Minneapolis,
MN
2016 – Professor in Biomedical Engineering, Fu Foundation School of
Engineering and Applied Science, Columbia University, New York, NY

- 2016 – Professor in Radiology, Vagelos College of Physicians and Surgeons, Columbia University, New York, NY
- 2016 – Professor in Applied Physics and Applied Mathematics, Fu Foundation School of Engineering and Applied Science, Columbia University, New York, NY

Hospital and Institutional Appointments:

- 1984 – 1989 Research Engineer, Radiology, University of Texas Southwestern, Dallas, TX
- 1989 – 1993 Chief Biomedical Engineer, Center for Nuclear Imaging Research, Philips Research Laboratories, Hamburg, Germany and University of Alabama at Birmingham, Birmingham, AL
- 1994 – 1995 Director of Engineering, Ctr. for Nuclear Imaging Research, University of Alabama at Birmingham, Birmingham, AL
- 1995 – 1999 Assistant in Physics, Massachusetts General Hospital, Boston, MA
- 1995 – 1999 Director of Engineering, Nuclear Magnetic Resonance Center, Massachusetts General Hospital, Boston, MA
- 1999 – 2016 Engineering Core Director, Center for Magnetic Resonance Research, University of Minnesota, Minneapolis, MN
- 2016 – Member and Principal Investigator at Mortimer B. Zuckerman Mind Brain Behavior Institute, Columbia University, New York, NY
- 2016 – Director, Magnetic Resonance Platform, Zuckerman Mind Brain Behavior Institute, Columbia University, New York, NY
- 2018 – Founding Director, Columbia Magnetic Resonance Research Center, Columbia University, New York, NY
- 2019 – Staff Scientist and Director of the High Field Imaging Laboratory, New York State Nathan Kline Psychiatric Research Institute, Orangeburg, NY

Honors:

- 1979 - Pi Mu Epsilon, National Mathematics Honor Society
- 1980 - Eta Kappa Nu, National Electrical Engineering Honor Society
- 1980 - Tau Beta Pi, National Engineering Honor Society -1981
- 1981 - NASA STS (Space Shuttle) Service Award
- 1981 - Phi Beta Kappa, National Academic Honor Society
- 1993 - UAB School of Engineering Dean's Award, Outstanding Graduate Student
- 1993 - UAB Department of Biomedical Engineering, Outstanding Graduate Student
- 2002 - Opening Plenary, International Society for Magnetic Resonance in Medicine
- 2005 – 2007 Board of Trustees, International Society for Magnetic Resonance in Medicine
- 2009 - Fellow, International Society for Magnetic Resonance in Medicine
- 2014 - Fellow, Institute of Electrical and Electronic Engineers
- 2015 - Lillian Quist-Joyce Henline Chair in Biomedical Research, Univ. of Minnesota
- 2015 - Nominee for ISMRM Gold Medal
- 2018 – Founding Director, Columbia Magnetic Resonance Research Center

Numerous international keynote lectures
 Numerous elected professional society committee chairs

Columbia Magnetic Resonance Research Center, Founded 2018

Founded Columbia Magnetic Resonance Research Center consisting of:

Personnel: 137 Investigators, 80 newly trained MR system operators, 450 experiment support and first responder staff with MR safety training.

Facilities: Six fully equipped and staffed MR Research Laboratories at Columbia University Irving Medical Center, Columbia University Cancer Center, Zuckerman Mind Brain Behavior Center, Fu School of Engineering and Applied Sciences, New York State Psychiatric Research Center, and New York State Nathan Kline Psychiatric Research Institute.

Equipment: 18 MR systems, 1.5T to 9.4T for human and animal research (13 full-time research, 5 clinical + research)

Data: Investigators' labs, MR facilities and MR systems are being fully integrated with Google Cloud Platform for data acquisition, archiving, curating, sharing and computing.

Academic Grant support: (\$130 m)

Past

1985 – 1990 NIH 1 P41 RR002584-01 RL Nunnally, PI; JT Vaughan, Co-PI Core Project 2, Engineering
 Institution: University of Texas Southwestern Medical Center, Dallas, TX
 Title: "Southwestern NMR Center for In Vivo Metabolism"
 Support: \$3.8m

1988 – 1990 Texas Advanced Technology Program RL Nunnally, PI;
 JT Vaughan, Co-PI
 Institution: University of Texas Southwestern Medical Center, Dallas, TX
 Title: "New Approaches to Radiofrequency Antennas for MR Imaging and Spectroscopy"
 Support: \$250,000

1988 – 1990 Dallas Biomedical, Inc. RL Nunnally, PI; JT Vaughan, Co-PI
 Institution: University of Texas Southwestern Medical Center, Dallas, TX
 Title: "Physiological Phantom Standard for NMR Imaging and Spectroscopy"
 Support: \$100,000

- 1992 – 1997 NIH 1 P41 RR07723-01 GM Pohost, PI; JT Vaughan, PI Core I, Engineering
Institution: University of Alabama at Birmingham, Birmingham, AL
Title: "Clinical NMR Studies at 4.1T"
Support: \$4.2m
- 1997 – 1998 NIH-NCRR-1R41 RR11754-01 JT Vaughan, PI
Institution: Harvard Medical School, Boston, MA and Advanced NMR Systems, Inc.,
Wilmington, MA.
Title: "Double Tuned Head Coils for High Field NMR,"
Support: \$95,881
- 1997 – 1998 NIH-NCI-1R-41RR12264-01 JT Vaughan, PI
Institution: Harvard Medical School, Boston, MA and Enon Microwave, Topsfield, MA
Title: "High Power TR Switch for High Field Human MRI,"
Support: \$99,000
- 1997 – 1999 NSF-DBI-9724627 JT Vaughan, PI
Institution: Massachusetts General Hospital, Boston, MA
Title: "Electromagnetics Analysis System for NMR,"
Support: \$310,691 direct with institutional matching
- 1997 – 1999 GE Medical Systems JT Vaughan, PI
Institution: Enon Microwave, Inc., Topsfield, MA
Title: RF Front End for 3T MRI System
Support: \$400,000
- 1998 - 1999 NIH-NCRR-1R-41-RR13230-01 JT Vaughan, PI
Institution: Enon Microwave, Topsfield, MA, and Massachusetts General Hospital,
Boston, MA
Title: "A Homogeneous Transmit Coil for High Field NMR"
Support: \$99,000
- 1996 – 2001 NIH-1 RO1 NS34626-01-A1 RG Gonzalez, PI; JT Vaughan, Co-I
Institution: Massachusetts General Hospital, Boston, MA
Title: "Molecular Neuroimaging of AIDS Dementia: Animal Models"
Support: \$984,865
- 1998 - 1999 DOD-ONDCP (B Rosen, PI; JT Vaughan, H. Breiter, authors and Co-PIs
Institution: Massachusetts General Hospital, Boston, MA
Title: A 7T Human MRI System for Studying Cocaine Addiction
Support: \$7,200,000 (including \$1,200,000 matched by Vaughan's grants)
- 1997 – 2000 Whitaker Foundation JT Vaughan, PI
Institution: Massachusetts General Hospital, Boston, MA
Title: "MR Imaging of the Brain at Very High Fields,
Support: \$179,319

- 1997 – 2002 NIH-NCI-2P 01 CA48729-09 T. Brady, PI; Vaughan PI Core B
Institution: Massachusetts General Hospital, Boston, MA
Title: “Biomedical Implications of Magnetic Susceptibility”
Support: \$1,848,260, Core B
- 1997 - 2002 NIH-NCRR- P41-RR08079, K Ugurbil, PI; JT Vaughan, PI Project 13
Institution: University of Minnesota, Minneapolis, MN
Title: “NMR Imaging and Localized Spectroscopy at High Magnetic Fields”
Support: \$4.7m
- 1999 – 2002 NIH- RO1 CA76535 J.T.Vaughan, PI
Institution: Massachusetts General Hospital, Boston, MA
Title: "Minimizing RF Losses in High Field MR Head Imaging"
Support: \$726,363
- 2000 – 2002 NIH-S10 RR139850 JT Vaughan, PI
Institution: University of Minnesota
Title: “A 9.4T NMR Imaging System for Primate Research”
Support: \$400,000
- 2002 – 2006 NIH-R33 CA94318 JT Vaughan, PI
Institution: University of Minnesota
Title: “High Field RF Coils for Improved Breast Cancer Detection”
Support: \$1,021,842
- 2002 -2005 NIH-R01 CA94200-01A1 01A1 J.T. Vaughan, PI
Institution: University of Minnesota
Title: “New RF Technology for Improved Breast Cancer Diagnostics”
Support: \$1,131,643
- 2002 – 2006 NIH-2 R42 RR13230-02 J.T. Vaughan, PI
Institution: Biomedical Engineering, Inc. with subcontract to University of Minnesota
Title: “A Homogeneous Transmit Coil for High Field Human NMR”
Support: \$518,000
- 2002 -2007 NIH-R01 EB00473 J Duncan, PI; JT Vaughan, PI subcontract
Institution: Yale University
Title: “Bioimaging and Intervention in Neocortical Epilepsy”
Support: \$876,870 for subcontract
- 2008 State of Alabama bond fund, JT Vaughan, originator and author
Institution: Auburn University
Title: MR Center for Auburn University and University of Alabama at Birmingham
Support: \$25m for Auburn

- 2008 State of Alabama bond fund, JT Vaughan, originator and author
Institution: University of Alabama at Birmingham
Title: MR Center for University of Alabama at Birmingham and Auburn University
Support: \$25m for UAB
- 2001 – 2006 NIH-R01 RR15413 K Ugurbil, PI, JT Vaughan, Co-I
Institution: University of Minnesota
Title: “Functional MRI in Humans at 7 Tesla”
Support: \$37,500 Vaughan budget
- 2004 – 2009 NIH- R01 EB000895-04 J.T.Vaughan, PI
Institution: University of Minnesota
Title: “Minimizing RF Losses in High Field MR Imaging” (renewal of R01 CA76535)
Support: \$1,992,897
- 2005 - 2008 NIH-Center Grant Supplemental Award J.T.Vaughan, Co-PI
Institution: University of Minnesota
Title: “MR Image-Guided Intervention in Breast Cancer”
Support: \$400,000
- 2007 – 2009 NIH-SBIR R43 CA126098-01 B Larson, T Vaughan, Co-PIs
Institution: MR Robotics, Inc.
Title: MRI-Guided Robotic Breast Cancer Interventions
Support: \$290,000
- 2009 – 2011 NIH S10 RR 25437 JT Vaughan, PI
Institution: University of Minnesota
Title: A Multi-Mode, Multi-Channel Transmitter for 9.4T NMR
Support: \$500,000 (ARA Stimulus grant)
- 2008 – 2013 NIH-PAR-02-010 Chris Collins, PI at Penn State, Vaughan, Co-I subcontract
Institution: Pennsylvania State University with subcontract to University of Minnesota
Title: “High Field MRI: Limitations and Solutions”
Support: \$663,446 for subcontract
- 2011 – 2013 NIH 1R41EB013543-01 JT Vaughan, PI
Institution: Life Services, LLC and U of MN
Title: Coils for Human Whole Body Imaging at 7T
Support: \$100,000
- 2011 – 2013 NIH 1 R01 EB011551-01A1 Yudong Zhu PI, JT Vaughan, subcontract PI
Institution: New York University
Title: RF Technology Innovation for Advancing High Field MR
Support: (sub contract) \$500,000

- 2010 – 2015 1 U54 MH091657 (Co-PI: Ugurbil) JT Vaughan Co-I
 Title: Mapping the Human Connectome: Structure, Function, and Heritability
 Costs: \$777,981 / anum
- 2013 – 2015 Siemens Grant Ugurbil, Vaughan, MPIs
 Title: 3T Body Coil
 Direct Costs: \$180,000
- 2008 – 2018 (renewed) NIH-P41 RR08079 K Ugurbil, PI; JT Vaughan, PI Engineering Core
 Institution: University of Minnesota
 Title: “NMR Imaging and Localized Spectroscopy”
 Support: \$984,683 for Core V (2013-2018 renewal)
- 2007 – 2016 (renewed) NIH-R01-EB006835 JT Vaughan, PI
 Institution: University of Minnesota
 Title: “Human MRI to 9.4T and Beyond”
 Support: \$ 1.5m (2013-2016 renewal)
- 2007 -2017 (renewed) NIH-R01 EB007327 JT Vaughan, PI
 Institution: University of Minnesota
 Title: “RF Safety Assurance for High Field MRI”
 Support: \$2m (2011-2017 renewal)
- 2014 – 2016 NIH 1 R01 EB011551-01A1 Chris Collins, PI, JT Vaughan, subcontract PI
 Institution: NYU
 Title: RF Technology Innovation for Advancing High Field MR
 Support: \$300,000 (subcontract)
- 2011 – 2016 P30 NS5076408 PI: Ugurbil, JT Vaughan, Co-I
 Institution: University of Minnesota
 Title: Institutional Center Cores for Advanced Neuroimaging
 Support: \$2.41m
- 2013 Samsung License (19 patents) from U. Minn, MGH, and UAB.
 Principal Inventor: JT Vaughan
 Institution: University of Minnesota
 Title: Patent Portfolio for multi-channel MRI
 Support: \$12m to UMN, \$330,000 to MGH, \$330,000 to UAB.
- 2014 – 2017 Samsung PI: JT Vaughan
 Institution: University of Minnesota
 Title: 3T Body Coil
 Support: \$1.2m
- 2014 – 2017 NIH NIMH R24-MH105998-01 JT Vaughan, MPI, MG Garwood
 Institution: University of Minnesota

Title: Imaging Brain Function in Real World Environments & Populations with Portable MRI

Support: \$1m

2015 – 2017 NIH NIMH 3R24-MH105998-02S1 JT Vaughan, MG Garwood, MPI

Institution: University of Minnesota

Title: Imaging Brain Function in Real World Environments & Populations with Portable MRI

Support: \$121,004 (supplement)

2016 – 2021 NIH1K99EB020058 Sung-Min Sohn, PI; JT Vaughan, mentor

Institution: University of Minnesota

Title: “Automatic RF Signal Tuning and Matching System for MR Imaging and Spectroscopy”

Support: \$1.2m

2016 – 2021 NIH 1 K99 EB021173-01A1 Yigitcan Eryaman, PI, JT Vaughan, mentor

Institution: University of Minnesota

Title: Magnetic Resonance Imaging of Neural Implants

Support: \$900,000

2014 – 2018 NIH 2R42EB013543-02 JT Vaughan, PI (Phase II STTR)

Institution: Life Services, LLC

Title: Coils for Human Whole-Body Imaging at 7T

Support: \$1m

2016 – 2018 NIH EB01869 NIH G Adriany, PI, JT Vaughan Co-I

Institution: Life Services, LLC

Title: Multi-channel transmit / Multi-channel receive coil array for human fMRI

Support: \$150,000

Current:

2016 - 2019 Columbia, JT Vaughan, PI

Title: Discretionary Startup

Institution: Columbia University

Support: \$3m

2017 - 2022 NIH U 01– EB025153 M Garwood PI, JT Vaughan Columbia U Subcontract PI

Title: Imaging Human Brain Function with Minimal Restrictions

Institutions: U. Minnesota, Columbia, Harvard, Yale, U. Sao Paulo, Victoria U.

Support: \$11.2 m, Columbia sub-contract: 3.2m

2018 - 2020 Columbia University RISE Grant; V. Ferrara, JT Vaughan, N Kriegescore, MPIs

Title: An Integrative Approach for Tracing Parallel Visual Pathways in the Non-human Primate Brain

Support: \$160,000

2018 - 2019 Columbia University Center Stimulus Grant, JT Vaughan PI

Title: Columbia Magnetic Resonance Research Center (CMRRC)

Support: \$50,000

2018 - Columbia SEAS SIRS/STAR Grant. PIs JT Vaughan, C Juchem

Title: Integrated Multi-Coil B0 and Radio-Frequency Technology for 1H Magnetic Resonance Spectroscopy of Cervical Spine Pathology in Multiple Sclerosis

Support: \$60,000

2018 - Google Development Grant

Title: First MR Research Center Integrated in the Google Cloud Platform (GCP) Google, Inc.

Support: \$20,000 in Cloud Credits

2018 - US-India State Dept. Grant; JT Vaughan, Sairam Geethanath, Rajesh Harsh, PIs

Title: - an Indiginous MRI system and IT network for India

Support \$100,000

Pending. (\$60m)

2020 - 2023 NSF MRI Grant. AR Franco PI, JT Vaughan co-PI

Institution: New York State Nathan Kline Psychiatric Research Institute, Orangeburg, NY

Title: Development of a Next Gen 9.4T Magnetic Resonance System for Translational Neuroscience

Support: \$4m from NSF, \$6m matching from NYS, \$2m from NKI. \$350,000 from Columbia

2020-2025 NIH Brain Initiative Grant JT Vaughan, contact PI

Institution: Columbia MR Research Center

Title: MR 2.0, Data Driven Neuroimaging

Support: \$16m

2020 – 2030 Sposored Research Agreement from Hillhouse Capital, Brunnsfield International.

JT Vaughan, PI

Institution: Columbia MR Research Center

Title: Accessible MR

Support: Phase 1 = \$32m

University Committees

- 1999 – 2004 NIH External Advisory Committee, Advanced Magnetic Resonance and Spectroscopy Facility, University of Florida, and National High Magnetic Field Laboratory
- 1999 – 2016 University of Minnesota, Department of Radiology, Center for Magnetic Resonance Research, Biennial High Field Workshop Planning Committee.
- 2000 - 2001 Graduate Program Planning, Dept. Biomedical Engineering, U. Minnesota
- 2007 – 2011 Promotions and Tenure Review, Dept. Radiology, University of Minnesota
- 2009 – 2015 Senate Research Committee, University of Minnesota
- 2011 - 2013 Office of the Vice President for Research, Research Risk Advisory Committee
- 2013 - 2015 Special Panel on Research Misconduct, Harvard University
- 2014 – Member, Board of Advisors, Tra Vinh University, Tra Vinh, Viet Nam
- 2016 - Chair, Columbia MR Research Center Faculty Advisory Committee
- 2017 - Chair, Columbia MR Research User's Group
- 2017 - Chair, Columbia MR Safety Committee and IRB Review
- 2017 - Member, Zuckerman Inst. Human Cognitive Imaging Committee
- 2018- Member, Zuckerman Preclinical MR Safety Committee
- 2018- Chair, MR Center Grant Planning Committee
- 2019- Member, MR Research Center Oversight Committee

Teaching Experience

Courses:

- 1986 – 1989 (annual) Basics of NMR Physics for medical interns, residents and fellows
Instructor: JT Vaughan
Institution: University of Texas Southwestern Medical School, Dept. of Radiology
- 1991 – 1995, Biomedical Magnetic Resonance Imaging I, BME 640/740, 3 units
Instructor: Don Twieg, with periodic lectures by JT Vaughan.
Institution: The University of Alabama at Birmingham, AL
- 1991 – 1995, Biomedical Magnetic Resonance Imaging II, BME 641/741, 3 units
Instructor: Don Twieg, with periodic lecturers by JT Vaughan
Institution: The University of Alabama at Birmingham, AL
- 1995 – 1999, MR Physics, 3 unit graduate course
Instructor: Bruce Rosen, with periodic lectures by JT Vaughan
Institution: Harvard/MIT Health Sciences Technology Program, Boston MA
- 1999 – 2002, Biophysics 8147, “MRI Instruments and Methods” 3 units
Instructor: Xiaoping Hu, with periodic lectures by JT Vaughan
Institution: Department of Biophysics, University of Minnesota, Minneapolis, MN

- 2001 - 2004 HCol 3070H "Honors Colloquium: Ethical Choices in Science & Technology",
3 units
Instructor: JT Vaughan
Institution: College of Liberal Arts, University of Minnesota, Minneapolis, MN
- 2003 – Biophysics 8293, “ MR Spectroscopy and Imaging”, 3 units
Instructor, Kamil Ugurbil, Michael Garwood with individual lectures by JT Vaughan
Institution: Department of Biophysics, University of Minnesota, Minneapolis, MN
- 2003 –2005, HCol 1001, “Freshman Honors Colloquium: Introduction to the Arts &
Sciences”
Instructor: Individual lectures by JT Vaughan
Institution: College of Liberal Arts, University of Minnesota, Minneapolis, MN
- 2004 – BME 8601 Biomedical Engineering Graduate Seminar
Instructors: John Bischoff, Bin He, lectures by JT Vaughan
Institution: Biomedical Engineering, University of Minnesota, Minneapolis, MN
- 2017 - 2019 BHD The Body in Health and Disease Preclinical Neuroscience Course
Instructors: Serge Przedborski, JT Vaughan
Institution: Columbia University Vagelos College of Physicians and Surgeons, New
York, NY
- 2018 Research to Revenue
Instructors: Sam Sia Case Study Mentor: JT Vaughan
Institution, School of Engineering and Applied Sciences + Business, Columbia
University
- 2020 - BMEN 600X Topics in MR Instrumentation
Instructor: JT Vaughan
Institution: Department of Biomedical Engineering, School of Engineering and Applied
Sciences
- 2020 - PSY 600X Human Brain Imaging for Cognitive Neuroscience: Data Acquisition,
Analysis, and Sharing
Instructors: N Kriegeskorte, L. Davachi, Special Lectures, JT Vaughan

Thesis Sponsorships and Committees

- 1993 – 1994, Suriyanarayanan Venkatraman, MS, BME
Advisor: D. Twieg, JT Vaughan, thesis project advisors
Institution: Department of Biomedical Engineering, University of Alabama at
Birmingham, AL

- 1993 – 1995, Nanqing Zhang, PhD, Physics
Advisor: T.F. Budinger, JT Vaughan project advisor
Institution: Department of Physics, University of California, Berkeley, CA
- 1997 – 1998, Andrew Josephson, MS, EE
Advisor: J.T. Vaughan (summer student)
Institution: Department of Electrical Engineering, University of Minnesota.
- 1997 – 1998, Mark Skubis, MS, Nuclear Sciences
Advisor: JT Vaughan
Institution: Massachusetts Institute of Technology, Nuclear Sciences
Thesis: "An Analytical Solution for Radiation Loss from a Small Current Loop"
- 1998 – 1999, Christian Haselgrove, MS Program
Advisor: JT Vaughan
Institution: MIT Nuclear Sciences
- 2000 – 2001 Eddie Auerbach, PhD, Biophysics
Advisory Committee: JT Vaughan
Institution: Biomedical Engineering, University of Minnesota
- 2001 – Nicola DeSanch, Ph.D, BME
Advisor: Peter Allen, JT Vaughan, External Examiner
Institution: University of Alberta Biomedical Engineering
Dissertation: "Anatomically-Tailored Magnetic Resonance Radiofrequency Probes"
- 2001 – Guang-Tsai Lei, PhD, EE
Advisor: J. Holte; J.T. Vaughan, Advisory Committee
Institution: Mayo Clinic, Department of Physiology and Biophysics,
Dissertation: "Elliptic Operators in Hilbert Space and in Microwave Engineering."
- 2001 – 2007 Jinfeng Tian, PhD, BME
Advisor: J.T. Vaughan
Institution: University of Minnesota, Biomedical Engineering
Dissertation Project: "Modeling of Electromagnetic Propagation and Losses in Coil Structures and Tissues for High Field NMR"
- 2001 – 2012 Carl Snyder, PhD BME
Advisor: J.T. Vaughan
Institution: University of Minnesota, Electrical Engineering
Thesis Project: RF Body Coils for Ultra-High field MRI
- 2002 Bethany Steichen
Advisor: JT Vaughan (summer student)
Institution: University of Minnesota, Center for Magnetic Resonance Research

Research Project: “A Critical Examination of the Influence of Magnetic Fields on Human Blood.”

- 2000 – 2004 Jang-Yeon Park, PhD
 Committee, JT Vaughan, member
 Institution: University of Minnesota, Biomedical Engineering
 Thesis Project: “RF Pulse Sequence Optimization for High Field NMR”
- 2002 – 2006 Robert Pinkerton, PhD
 Advisor, Ravi Menon, JT Vaughan external examiner
 Institution: Western University, London Ontario
 Thesis Project: “RF Coils for MRI”
- 2003 –2011 Can Akun, PhD, BME
 Advisor: JT Vaughan
 Institution: University of Minnesota, Electrical Engineering
 Thesis Project: Optimal field generators for high RF coils
- 2004 – 2007 Joshua Holwell, MS EE
 Advisor: JT Vaughan
 Institution: University of Minnesota, Electrical Engineering
 Thesis Project: Phased Array Receivers for High Field MRI
- 2003-2007 Chris Olson, MS Student
 Degree status: MS EE received 2007
 Thesis / Project Advisors: A. Gopinath / JT Vaughan
 Institution: University of Minnesota, Electrical Engineering
 Thesis Project: “RF localization for high field MRI”
- 2005- 2009 Hyongsuk Yoo, PhD
 Thesis Advisors: A. Gopinath, JT Vaughan
 Institution: University of Minnesota, Electrical Engineering
 Thesis Project: “Electromagnetics of waveguides, scattering, and MRI systems”
- 2008 – 2014 Leeor Alon, PhD
 Thesis Advisor, Dan Sodickson. JT Vaughan, external examiner.
 Institution: New York University
 Thesis Project, RF power deposition and temperature mapping.
- 2009 – 2014 Sung-Min Sohn, PhD
 Advisors: A. Gopinath, JT Vaughan
 Institution: University of Minnesota, Electrical Engineering
 Thesis Project: “Auto-tuning of RF transmission line coil for high-fields MRI systems”
- 2011 – 2016 Albert Jang, PhD
 Advisor: JT Vaughan

Institution: University of Minnesota, Electrical Engineering
Thesis Project: "MR Imaging in Inhomogeneous Fields"

2016 – 2019 Julie Kabil, PhD

Intern Advisor: JT Vaughan

Institution: University of Lorraine, Nancy, France

2017 - Marina Manso, MS

Intern Advisor: JT Vaughan

Institution: University of Groningen, The Netherlands

2018 - Jia Guo, PhD

Advisor: Andrew Laine; JT Vaughan, Committee Member

Institution: BME, Columbia University

2018 - Gehua Tong, BME Doctoral Student

Advisor: JT Vaughan

Institution: BME, Columbia University

2018 - Enlin Qian, BME Doctoral Student

Advisor: JT Vaughan

Institution: BME, Columbia University

2018 - Israel Chavarria, Intern

Intern Advisor: JT Vaughan, Intern Advisor

Institution: APAM, Columbia University

2018 – El Sherif Mahmoud, EE MS

Advisor: JT Vaughan

Institution: EE, Columbia University

2018 - Yunsuo Duan, PhD, Assist. Prof., MRI Research, Dept. Psychiatry

Career Mentor: JT Vaughan

Institution: Career Mentoring Program, Columbia University Irving Medical Center

2018 - Course: Research to Revenue

Professor: Sam Sia

Case Study Mentor: JT Vaughan

Institution, SEAS+ Business, Columbia University

2019 - David Parker, PhD

Advisor: Ray Razlighi, JT Vaughan co-advisor and examiner

Institution: Department of Biomedical Engineering, School of Engineering and Applied Sciences, Columbia University

Thesis: Optimal Correction of The Slice Timing Problem and Subject Motion Artifacts in fMRI/

2019 - Xinyang Feng, Ph.D.

Advisor: A Laine, JT Vaughan Advisory Committee

Institution: Department of Biomedical Engineering, School of Engineering and Applied Science, Columbia University

2020 – Seyed Hossein Mirjahanmardi, MSEE

Advisor: O.M Ramahi, JT Vaughan, External Advisor

Institution: Department of Electrical and Computer Engineering, University of Waterloo, Canada

Supported/Mentored Graduate Students, Post Docs and Research Scientists

1993 – 1994, Suriyanarayanan Venkatraman, MS, BME

Institution: Student in BME, University of Alabama at Birmingham, AL

Current Employment: General Electric Healthcare

1997 – 1998, Andrew Josephson, MS, EE

Institution: Student at MGH/Harvard EE

Current Employment: General Dynamics

1998 - 1999, Lawrence Wald, PhD, Biophysics

Institution: Research Scientist at MGH/Harvard

Current Employment: MGH/Harvard/MIT Martinos Center

1998 - 1999, Douglas Kelley, PhD, EE

Institution: Research Scientist at MGH

Current Employment: General Electric Healthcare

1997 – 1998, Mark Skubis, MS, Nuclear Sciences

Institution: Student in Harvard/MIT Health Science Technologies (HST) Nuclear Sciences

Current Employment: US Navy (Nuclear Submarine Captain)

1998 – 1999, Christian Haselgrove, MS, Nuclear Sciences

Institution: Student in Harvard/MIT HST, Nuclear Sciences

Current Employment: NIH

1999 - Gregor Adriany, PhD, EE

Institution: Research Scientist, Center for Magnetic Resonance Research, U of Minnesota

Current Employment: University of Minnesota

2000 – 2001 Eddie Auerbach, PhD, Biophysics

- Institution: Student in Biophysics, University of Minnesota
 Current Employment: University of Minnesota, Center for Magnetic Resonance Research
- 2001 – 2018 Jinfeng Tian, PhD, BME
 Institution: Student, Post Doc, Scientist in BME at University of Minnesota and Columbia
 Current Employment: US Food and Drug Administration
- 2001 – 2012 Carl Snyder, PhD BME
 Institution: Student, Post Doc in BME at University of Minnesota
 Current Employment: Champaign Imaging, LLC, Minneapolis
- 2002 Bethany Steichen, MD
 Institution: University of Minnesota, Center for Magnetic Resonance Research
 Current Employment: -an MD somewhere
- 2002 - 2016 Lance Delabarre, PhD Biophysics
 Institution: Post Doc, Research Associate, University of Minnesota
 Current: Center for Magnetic Resonance Research, University of Minnesota
- 2003 –2011 Can Akun, PhD, BME
 Institution: University of Minnesota, Electrical Engineering
 Current Employment: Flywheel, LLC, Minneapolis
- 2004 – 2007 Joshua Holwell, MS EE
 Institution: University of Minnesota, Electrical Engineering
 Current Employment: MR Instruments, LLC, Minneapolis
- 2003 - 2007 Chris Olson, MS
 Institution: University of Minnesota, EE
 Current Employment: - a Chicago Engineering Firm.
- 2005- 2009 Hyongsuk Yoo, PhD
 Institution: University of Minnesota, Electrical Engineering
 Current Employment: KAIST, Seoul
- 2009 – 2018 Sung-Min Sohn, PhD
 Institution: Student, Post Doc, Scientist at University of Minnesota, Electrical Engineering
 Current Employment: Arizona State Univ.
- 2011 – 2016 Yigitcan Eryman
 Institution: Post Doc, Research Scientist at Univ. Minnesota Ctr. for MR Research.
 Current Employment: Univ. Minnesota, CMRR
- 2012 - 2016 Russell LaGore, MS EE

Institution: Research Engineer, University of Minnesota
 Current Employment, Center for Magnetic Resonance Research, University of Minnesota

- 2016 - Present, Julie Kabil, PhD, BME
 Institution: University of Lorraine, Nancy, France
 Current Employment: Post Doc at Columba MR Research Center
- 2016 - Present, Ray Lee, PhD
 Position: Research Scientist
 Institution: ZMBBI, Columbia University
- 2016 - Present, Kathleen Durkin, MS
 Position: Research Administrator
 Institution: ZMBBI, Columbia University
- 2017 - Present, Dania Elder, BS
 Position: Senior MR Tech.
 Institution: ZMBBI, Columbia, University
- 2017 - Present Marina Manso, PhD
 Institution: Intern from University of Groningen, The Netherlands
 Current Employment: Post Doc at Zuckerman Inst., Columbia MR Research Ctr.
- 2017 - Present Sairam Geethanath
 Institution: Post Doc, Radiology, now Research Scientist, Zuckerman Institute
 Current: Zuckerman Mind Brain Behavior Institute, Columbia University
- 2018 - Present Jia Guo, PhD, BME
 Position: Post Doc transitioning to Research Scientist
 Current Employment, ZI, Columbia University
- 2018 - Gehua Tong, MS
 Co-mentor: Sairam Geethanath
 Position: BME Doctoral Student
 Current Institution: Columbia University
- 2018 - Enlin Qian, MS
 Co-mentor: Sairam Geethanath
 Institution: BME Doctoral Student
 Current Institution BME, Columbia University
- 2018 - Israel Chavarria, BS
 Position: Student Intern
 Current Institution: APAM, Columbia University
- 2018 - ElSherif Mahmoud, BS

- Position: MS Student
Current Institution: EE, Columbia University
- 2018 - Peidong He, MS
Co-mentor: Sairam Geethanath
Position, BME MS Student
Institution: Columbia, University
- 2018 - Yunsuo Duan, PhD,
Position: Assist. Prof., MRI Research, Dept. Psychiatry
Institution: Career Mentoring Program, Columbia University Irving Medical Center
- 2018 - Student Team in Research to Revenue Course
Prof: Sam Sia
Case Study Mentor: JT Vaughan
Institution, School of Engineering and Applied Sciences + School of Business, Columbia University
- 2019 - Niveta Ramakrishnan
Position: 3rd Year Medical Student Intern
Institution: The Royal College of Surgeons in Ireland
- 2019 - David Hidary
Co-mentor: Ray Lee
Position: Highschool Summer Intern
Institution: Zuckerman Mind Brain Behavior MR Platform
- 2019 - Zhihua Ren, MSEE
Position: PhD Student, Senior Year Intern
Institution: Electrical Engineering, Singapore University of Technology and Design
- 2019 - Keerthi Sravan Ravi, MS BME
Co-mentor: Sairam Geethanath
Position: Ph.D. Student
Institution: BME Department, School of Engineering and Applied Science, Columbia University
- 2019 - Sabrina Josephine Gjerswold-Selleck, MS
Co-mentor, Jia Guo
Position: Ph.D. Student
Institution: Neurology Department, College of Physicians and Surgeons, Columbia University
- 2019 - Haoran Sun
Co-mentor: Jia Guo
Position: Ph.D. Student

Institution: Neurology Department, College of Physicians and Surgeons, Columbia University

2019 - Rosalie Zhu, MS (Jia Guo's)

Co-mentor: Jia Guo

Position: Ph.D. Student

Institution: Neurology Department, College of Physicians and Surgeons, Columbia University

2019 - Chen Raphael Liu, MS (Jia Guo's)

Co-mentor: Jia Guo

Position: Ph.D. Student

Institution: Neurology Department, College of Physicians and Surgeons, Columbia University

2019 - David Gultekin, PhD

Position: MR Physicist and Safety Officer

MR Platform, Zuckerman Mind Brain Behavior Institute, Columbia University

Other professional activities

Editorial

2003 – present, Editorial Board for John Wiley & Sons, “NMR in Biomedicine”

2006 – 2010, Guest Editor for Special Ed. of NMR in Biomedicine

2007 – 2012 Section Editor to John Wiley, Encyclopedia for NMR.

2008 – 2012 Book Editor for John Wiley Handbook of RF Coils for MRI.

2012 – present, Book Editor for John Wiley Handbook of RF Safety for MRI.

Consultative

1994 – present, NIH reviewer on numerous standing and ad hoc NIH study sections for review of SBIR, STTR, R-41, R-01, R-21, R-33, S-10, and P-41 grant applications and site visits. (approximately 3 sections /year since 1994)

1997 – present, NSF reviewer for SIG, SBIR and STTR grant applications.

1989 – 1992 Radiofrequency Scientist in the Technical Systems Division of the Philips Research Labs, Hamburg, Germany

1994 – 2009 Founder, President, Bioengineering, Inc., Birmingham,AL/ Stillwater, MN

1995 – 1997 Advanced NMR Systems, Inc, Wilmington,MA building first GE 3T MRI

1996 – 1998 Medical Advances, Inc., Waukesha, WI

1996 – 2000 VP and Board of Directors, Enon Microwave, Inc., Topsfield, MA

1998 – 2000 General Electric Medical Systems, Milwaukee, WI

1999 – 2002 HF Imaging, Inc., Minneapolis, MN

2000 – 2010 Varian Medical System, Inc. Palo Alto, CA

2000 – 2012 National Institute of Radiological Sciences, Tsukuba, Japan

2001 – present Board of Advisors, Wang NMR, Livermore CA

2002 –2005 USA Instruments, Inc. Cleveland, OH

2002 – 2008 Founder, CTO, Board of Directors, MR Instruments, Inc, Minneapolis, MN
 2002 – 2009 Bruker Biospin MRI, GmbH. Ettlingen, Germany
 2004 – 2010 CEA Neurospin, Saclay, France
 2005 – 2010 Medtronic, Fridley, MN
 2005 – 2009 Hitachi Corporate Research, Tokyo, Japan
 2005 – present, Founder, owner, MRI Robotics, LLC., Minneapolis, MN
 2007 – present, Board, Jupiter Imaging, Livermore, CA.
 2008 – present, Board of Advisors, Medspira, Inc., Minneapolis, Rochester, MN
 2009 – present, Founder and CTO of Life Services, LLC., Minneapolis, MN
 2010 – present, Founder and President of MR Safe Devices, LLC., Minneapolis, MN
 2011 – present, Expert Consultant – Hand Arendall LLC, Birmingham, AL
 2011 – present, Expert Consultant – Maynard, Cooper, and Gale, PC, Birmingham, AL
 2011 – present, Consulting Advisor – Samsung Electronics Co., Seoul S. Korea
 2014 – present, Member and consultant, Brigham and Women’s 7T Task Force, Boston, MA
 2015 – present, Advisor, Foundation for Cancer Care in Tanzania
 2015 - present, Board of Advisors, Tra Vinh School of Engineering, Tra Vinh, Viet Nam
 2016 – present, Advisor to the Dean’s Office, U. Illinois College of Medicine

Publications:

Original, Peer Reviewed Articles

(NIH format, chronological)

1. Brateman L, Jennings LW, Nunnally RL, Vaughan JT. Evaluations of magnetic-resonance-imaging parameters with simple phantoms. *Medical Physics*. 1986;13(4):441-8. doi: 10.1118/1.595894. PubMed PMID: WOS:A1986D182200002.
2. Malloy CR, Jeffrey FM, Klein DL, Lange RA, Babcock EE, Vaughan JT, Peshock RM, Nunnally RL. Single and double coil methods for P-31 NMR-spectroscopy of the human myocardium. *Circulation*. 1987;76(4):245-. PubMed PMID: WOS:A1987K429000987.
3. Babcock EE, Vaughan JT, Lesan B, Nunnally RL. Multinuclear NMR investigations of probe construction materials at 4.7-T. *Magnetic Resonance in Medicine*. 1990;13(3):498-503. doi: 10.1002/mrm.1910130317. PubMed PMID: WOS:A1990CV21700016.
4. Fleckenstein JL, Archer BT, Barker BA, Vaughan JT, Parkey RW, Peshock RM. Fast short-tau inversion-recovery MR imaging. *Radiology*. 1991;179(2):499-504. doi: 10.1148/radiology.179.2.2014300. PubMed PMID: WOS:A1991FH13000037.
5. Vaughan JT, Hetherington HP, Harrison JG, Otu JO, Pan JW, Noa PJ, Pohost GM. High frequency coils for clinical nuclear magnetic resonance imaging and spectroscopy. *Phys Medica*, vol. 9, pp. 147-53, 1993.
6. Vaughan JT, Hetherington HP, Otu JO, Pan JW, Pohost GM. High-frequency volume coils for clinical NMR imaging and spectroscopy. *Magnetic Resonance in Medicine*. 1994;32(2):206-18. doi: 10.1002/mrm.1910320209. PubMed PMID: WOS:A1994NZ79300008.

7. Hetherington HP, Mason GF, Pan JW, Ponder SL, Vaughan JT, Twieg DB, Pohost GM. Evaluation of cerebral gray and white-matter metabolite differences by spectroscopic imaging at 4.1T. *Magnetic Resonance in Medicine*. 1994;32(5):565-71. doi: 10.1002/mrm.1910320504. PubMed PMID: WOS:A1994PN57500003.
8. Hetherington HP, Luney DJE, Vaughan JT, Pan JW, Ponder SL, Tschendel O, Twieg DB, Pohost GM. 3D P-31 spectroscopic imaging of the human heart at 4.1-T. *Magnetic Resonance in Medicine*. 1995;33(3):427-31. doi: 10.1002/mrm.1910330318. PubMed PMID: WOS:A1995QK08600017.
9. Pan JW, Vaughan JT, Kuzniecky RI, Pohost GM, Hetherington HP. High resolution neuroimaging at 4.1 T. *Magnetic Resonance Imaging*. 1995;13(7):915-21. doi: 10.1016/0730-725x(95)02002-b. PubMed PMID: WOS:A1995TN08400001.
10. Hetherington HP, Kuzniecky RI, Pan JW, Vaughan JT, Twieg DB, Pohost GM. Application of high-field spectroscopic imaging in the evaluation of temporal-lobe epilepsy. *Magnetic Resonance Imaging*. 1995;13(8):1175-80. doi: 10.1016/0730-725x(95)02029-s. PubMed PMID: WOS:A1995TJ68100019.
11. Hetherington H, Kuzniecky R, Pan J, Mason G, Morawetz R, Harris C, Faught E, Vaughan T, Pohost G. Proton nuclear-magnetic-resonance spectroscopic imaging of human temporal-lobe epilepsy at 4.1 T. *Annals of Neurology*. 1995;38(3):396-404. doi: 10.1002/ana.410380309. PubMed PMID: WOS:A1995RU33300008.
12. Vaughan JT, Haupt DN, Noa PJ, Vaughn JM, Pohost GM. RF front-end for a 4.1-tesla clinical NMR spectrometer. *IEEE Transactions on Nuclear Science*. 1995;42(4):1333-7. doi: 10.1109/23.467862. PubMed PMID: WOS:A1995RP81900192.
13. Chu WJ, Hetherington HP, Kuzniecky RI, Vaughan JT, Twieg DB, Faught RE, Gilliam FG, Hugg JW, Elgavish GA. Is the intracellular pH different from normal in the epileptic focus of patients with temporal lobe epilepsy? A P-31 NMR study. *Neurology*. 1996;47(3):756-60. doi: 10.1212/wnl.47.3.756. PubMed PMID: WOS:A1996VG59600023.
14. Pan JW, Hetherington HP, Vaughan JT, Mitchell G, Pohost GM, Whitaker JN. Evaluation of multiple sclerosis by H-1 spectroscopic imaging at 4.1 T. *Magnetic Resonance in Medicine*. 1996;36(1):72-7. doi: 10.1002/mrm.1910360113. PubMed PMID: WOS:A1996UT36800012.
15. Pan JLW, Mason GF, Vaughan JT, Chu WJ, Zhang YT, Hetherington HP. C-13 editing of glutamate in human brain using J-refocused coherence transfer spectroscopy at 4.1 T. *Magnetic Resonance in Medicine*. 1997;37(3):355-8. doi: 10.1002/mrm.1910370308. PubMed PMID: WOS:A1997WJ66400007.
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Resonance in Medicine. 1998;39(3):346-53. doi: 10.1002/mrm.1910390303. PubMed PMID: WOS:000072087900002.

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22. Yacoub E, Shmuel A, Pfeuffer J, Van de Moortele PF, Adriany G, Andersen P, Vaughan JT, Merkle H, Ugurbil K, Hu XP. Imaging brain function in humans at 7 Tesla. *Magnetic Resonance in Medicine*. 2001;45(4):588-94. doi: 10.1002/mrm.1080. PubMed PMID: WOS:000167819100009.

23. Vaughan JT, Garwood M, Collins CM, Liu W, DelaBarre L, Adriany G, Andersen P, Merkle H, Goebel R, Smith MB, Ugurbil K. 7T vs. 4T: RF power, homogeneity, and signal-to-noise comparison in head images. *Magnetic Resonance in Medicine*. 2001;46(1):24-30. doi: 10.1002/mrm.1156. PubMed PMID: WOS:000169561000005.

24. Raynaud JS, Duteil S, Vaughan JT, Hennel F, Wary C, Leroy-Willig A, Carlier PG. Determination of skeletal muscle perfusion using arterial spin labeling NMRI: Validation by comparison with venous occlusion plethysmography. *Magnetic Resonance in Medicine*. 2001;46(2):305-11. doi: 10.1002/mrm.1192. PubMed PMID: WOS:000170114100014.

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27. Vaughan JT, Adriany G, Garwood M, Yacoub E, Duong T, DelaBarre L, Andersen P, Ugurbil K. Detunable transverse electromagnetic (TEM) volume coil for high-field NMR. *Magnetic Resonance in Medicine*. 2002;47(5):990-1000. doi: 10.1002/mrm.10141. PubMed PMID: WOS:000175346100020.
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29. Lazovic-Stojkovic J, Yang QX, Collins CM, Liu WZ, Vaughan JT, Smith MB. Hexagonal zero mode coil: A single channel multi-coil design for small animal magnetic resonance Imaging. Moxon K, ElSherif D, Kanakasabai S, editors 2002. 65-6 p.
30. Lazovic-Stojkovic J, Yang QX, Stojkovic D, Liu WZ, Vaughan JT, Smith MB. Hexagonal coil: A single channel multi-coil design for small animal imaging. *Developmental Neuroscience*. 2002;24(5):452-3. PubMed PMID: WOS:000181910500029.
31. Ugurbil K, Adriany G, Andersen P, Chen W, Garwood M, Gruetter R, Henry PG, Kim SG, Lieu H, Tkac I, Vaughan T, Van de Moortele PF, Yacoub E, Zhu XH. Ultrahigh field magnetic resonance imaging and spectroscopy. *Magnetic Resonance Imaging*. 2003;21(10):1263-81. doi: 10.1016/j.mri.2003.08.027. PubMed PMID: WOS:000188123800018.
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33. Collins CM, Liu WZ, Wang JH, Gruetter R, Vaughan JT, Ugurbil K, Smith MB. Temperature and SAR calculations for a human head within volume and surface coils at 64 and 300 MHz. *Journal of Magnetic Resonance Imaging*. 2004;19(5):650-6. doi: 10.1002/jmri.20041. PubMed PMID: WOS:000221254100024.
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38. Lazovic J, Stojkovic DS, Collins CM, Yang QX, Vaughan JT, Smith MB. Hexagonal zero mode TEM coil: A single-channel coil design for imaging multiple small animals. *Magnetic Resonance in Medicine*. 2005;53(5):1150-7. doi: 10.1002/mrm.20459. PubMed PMID: WOS:000228796900022.
39. Van De Moortele PF, Akgun C, Adriany G, Moeller S, Ritter J, Collins CM, Smith MB, Vaughan JT, Ugurbil K. B-1 destructive interferences and spatial phase patterns at 7 T with a head transceiver array coil. *Magnetic Resonance in Medicine*. 2005;54(6):1503-18. doi: 10.1002/mrm.20708. PubMed PMID: WOS:000233655200022.
40. Terpstra M, Vaughan TJ, Ugurbil K, Lim KO, Schulz SC, Gruetter R. Validation of glutathione quantitation from STEAM spectra against edited H-1 NMR spectroscopy at 4T: application to schizophrenia. *Magnetic Resonance Materials in Physics Biology and Medicine*. 2005;18(5):276-82. doi: 10.1007/s10334-005-0012-0. PubMed PMID: WOS:000234549700007.
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42. Vaughan JT. Ultra high field MRI: high-frequency coils. *Ultra High Field Magnetic Resonance Imaging 2006*. p. 127-61.
43. Vaughan JT, DelaBarre L, Snyder C, Garwood M, Adriany G, Bolan PJ, Ugurbil K: RF Technology and Techniques for Highest Field MRI. In: *Proceedings of IEEE Trans Biomed Eng, 2006*
44. Vaughan JT, DelaBarre LJ, Snyder CJ, Tian J, Bolan PJ, Garwood MG, Ugurbil K, Highest field human imaging, *IEEE Trans Electromagn Compat*, p. 213, 2006.
45. Vaughan JT, Snyder C, DelaBarre L, Tian JF, Akgun C, Ugurbil K, Olson C, Gopinath A. Current and Future Trends in Magnetic Resonance Imaging (MRI), 2006 IEEE MTT-S International Microwave Symposium Digest, San Francisco, CA, 2006, pp. 211-212. doi: 10.1109/MWSYM.2006.249451"
46. Vaughan T, DelaBarre L, Snyder C, Tian JF, Akgun C, Shrivastava D, Liu WZ, Olson C, Adriany G, Strupp J, Andersen P, Gopinath A, van de Moortele PF, Garwood M, Ugurbil K. 9.4T human MRI: Preliminary results. *Magnetic Resonance in Medicine*. 2006;56(6):1274-82. doi: 10.1002/mrm.21073. PubMed PMID: WOS:000242388400012.

47. Shrivastava D, Hanson T, Schlentz R, Gallagher W, Snyder C, DelaBarre L, Prakash S, Laizzo P, Vaughan JT, Asme. MR safety and in vivo thermal characterization of an RF coil at 9.4T. ASME. Summer Bioengineering Conference, ASME 2007 Summer Bioengineering Conference ():699-700. doi:10.1115/SBC2007-176078.
48. Shrivastava D, Hanson T, Schlentz R, Gallagher W, Snyder C, DelaBarre L, Prakash S, Laizzo P, Vaughan JT. Radiofrequency heating at 9.4T: In vivo temperature measurement results in swine. *Magnetic Resonance in Medicine*. 2008;59(1):73-8. doi: 10.1002/mrm.21425. PubMed PMID: WOS:000251979600010.
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56. Shrivastava D, Hanson T, Kulesa J, DelaBarre L, Laizzo P, Vaughan JT. Radio frequency heating at 9.4T (400.2 MHz): in vivo thermoregulatory temperature response in swine. *Magnetic Resonance in Medicine*. 2009 Oct;62(4):888-95. doi: 10.1002/mrm.22072. PubMed PMID: 19572392; WOS:000270558700007.

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60. Adriany G, Auerbach EJ, Snyder CJ, Gozubuyuk A, Moeller S, Ritter J, Van de Moortele PF, Vaughan T, Ugurbil K. A 32-Channel lattice transmission line array for parallel transmit and receive MRI at 7 Tesla. *Magnetic Resonance in Medicine*. 2010;63(6):1478-85. doi: 10.1002/mrm.22413. PubMed PMID: WOS:000278164400007.
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field magnetic resonance imaging. 2010 IEEE MTT-S International Microwave Symposium Digest2010. p. 756-9.

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