

**Harvard Medical School/Harvard School of Dental Medicine
Format for the Curriculum Vitae**

Date Prepared: February 19, 2025
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Place of Birth: Philadelphia, Pennsylvania

Education

1977	A.B.	Astronomy and Astrophysics	Harvard University, Cambridge, MA
1980	M.S.	Physics	Massachusetts Institute of Technology, Cambridge, MA
1982	M.D.	Medicine	Hahnemann Medical College, Philadelphia, PA
1984	Ph.D.	Medical Physics	Massachusetts Institute of Technology, Cambridge, MA

Postdoctoral Training

Internship & Residencies:

1983-1984	Clinical and Research Fellow	Department of Radiology	Massachusetts General Hospital, Boston, MA
1984-1987	Resident	Diagnostic Radiology, Department of Radiology	Massachusetts General Hospital, Boston, MA

Research Fellowships:

1982-1983	Helen Bernstein Fellow		Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA
1983-1984	Clinical and Research Fellow	Department of Radiology	Massachusetts General Hospital, Boston, MA

Faculty Academic Appointments

1983-1984	Clinical and Research Fellow	Radiology	Harvard Medical School
1984-1987	Clinical Fellow	Radiology	Harvard Medical School
1987-1988	Instructor	Radiology	Harvard Medical School
1988-1991	Assistant Professor	Radiology	Harvard Medical School
1991-1999	Associate Professor	Radiology	Harvard Medical School
1999-	Professor	Radiology	Harvard Medical School
2007-	Professor	Health Sciences and Technology	Harvard-MIT Division of Health Sciences and Technology
2013-2014	Professor (International Scholar)	Meridian & Acupuncture	Kyung Hee University, Seoul Korea
2013-	Laurence Lamson Robbins Professor	Radiology	Harvard Medical School
2014-2017	Adjunct Professor	Center for Drug Discovery, Bouve College of Health Sciences	Northeastern University

Appointments at Hospitals/Affiliated Institutions

1987-1992	Director of Clinical NMR	Radiology	Massachusetts General Hospital
1987-1988	Assistant in Radiology	Radiology	Massachusetts General Hospital
1988-1991	Assistant Radiologist	Radiology	Massachusetts General Hospital
1991-1998	Associate Radiologist	Radiology	Massachusetts General Hospital
1992-1998	Co-Director, MGH NMR Center	Radiology	Massachusetts General Hospital
1998-	Radiologist	Radiology	Massachusetts General Hospital
1998-2000	Director, MGH NMR Center	Radiology	Massachusetts General Hospital
2000-	Director, Athinoula A. Martinos Center for Biomedical Imaging	Radiology	Massachusetts General Hospital
07/2019-	Vice Chair of Research	Radiology	Massachusetts General Hospital
04/2024-	Vice Chair Executive Committee on Research (ECOR)	MGH	Massachusetts General Hospital

Other Professional Positions

1985-1987	Visiting Scientist	Department of Nuclear Engineering, Massachusetts Institute of Technology
1987-1991	Lecturer	Department of Nuclear Engineering, Massachusetts Institute of Technology
1988-1991	Assistant Professor	Harvard-MIT Division of Health Sciences and Technology
1991-1998	Associate Professor	Harvard-MIT Division of Health Sciences and Technology

1992-1998	Visiting Associate Professor	Department of Nuclear Engineering, Massachusetts Institute of Technology
1992-1995	Director, Radiological Sciences and Radiological Sciences Joint Program	Department of Nuclear Engineering, Massachusetts Institute of Technology and Harvard-MIT Division of Health Sciences and Technology
1995	Co-Director, Radiological Sciences and Radiological Sciences Joint Program	Department of Nuclear Engineering, Massachusetts Institute of Technology and Harvard-MIT Division of Health Sciences and Technology
2001-2004	Senior Lecturer	Department of Nuclear Engineering, Massachusetts Institute of Technology
2006-2007	National Science Director	The MIND Institute, Albuquerque, NM
2009	Imaging External Advisory Board	Caltech Brain Imaging Center
2009	External Advisory Board, Biomarker Review	Novartis Institutes for Biomedical Research

Major Administrative Leadership Positions

1987-1992	Director of Clinical MRI Service	Department of Radiology, Massachusetts General Hospital
1992-1998	Co-Director, MGH NMR Center	Department of Radiology, Massachusetts General Hospital
1998-2000	Director, MGH NMR Center	Department of Radiology, Massachusetts General Hospital
2000-	Director, Athinoula A. Martinos Center for Biomedical Imaging	Department of Radiology, Massachusetts General Hospital/ Harvard-MIT Division of Health Sciences and Technology

Committee Service

Local

1989	Committee on the Future Direction of the Radiological Science Program, Committee on Graduate Education	Harvard-MIT Division of Health Sciences and Technology Secretary
1989-1993	Committee on Resident Education	Massachusetts General Hospital Department of Radiology Member
1990-1994	Radiology Quality Assurance Committee	Massachusetts General Hospital Department of Radiology Member

National and International

1990-1994	Grant Review Study Section	American Cancer Society: Clinical Investigators III-Prevention, Diagnosis, and Therapy Member
1992-1994	Diagnostic Imaging Board of Scientific Advisors	Sterling Pharmaceuticals Member

1993-1994	Organizing Committee	XIX Princeton Conference Member
1996-	Board of Directors	Organization for Human Brain Mapping Treasurer and Member
1999-2001	Executive Committee	National Foundation for Functional Brain Imaging Member
1999-2007	Executive Committee	The MIND Institute Member
2004-	Board of Scientific Counselors	National Institute of Mental Health Permanent Member
2004		Sackler Institute/Weill Cornell Medical College of Cornell University Program Reviewer
2005	Council Work Group on MRI Research Practices	National Institute of Mental Health Member
2005	Scientific Steering Committee	Initiative on Innovative Computing at Harvard University Member
2007	Blue Ribbon Panel	National Institute of Mental Health Division of Intramural Research Programs Member
2007	Executive Committee	Mind Research Network (formerly The MIND Institute) Member
2007-2009	Science Advisory Board	Mind Research Network Member
2009	International Scientific Advisory Board	University College of London Member
2009	IEEE International Symposium on Biomedical Imaging	General Chair
2014-2024	Multi-Council Working Group for NIH BRAIN	Advisory Counsel
2016	Scientific Advisory Board	Organization for Human Brain Mapping
2019-	Council Member	National Institute of Biomedical Imaging and Bioengineering

Professional Societies

1986-1994	Society of Magnetic Resonance in Medicine	Member
1988-	Radiological Society of North America	Member
1988-1995	American College of Radiology	Member
1988-	American Roentgen Ray Society	Member
1988-1994	Society of Magnetic Resonance	Member

	Imaging	
1988-1993	Massachusetts Medical Society	Member
1988-1993	Suffolk District Medical Society	Member
1988-	New England Roentgen Ray Society	Member
1991-	American Society of Neuroradiology	Member
1992-1993	Society of Magnetic Resonance in Medicine	Board of Trustees
1992-1994	Society of Magnetic Resonance in Medicine	Publication Committee
1993-1994	Society of Magnetic Resonance in Medicine	Board of Trustees
1993-1994	Society of Magnetic Resonance in Medicine	Education Committee
1994-1995	Society of Magnetic Resonance in Medicine	Board of Trustees
1994-1995	Society of Magnetic Resonance in Medicine	Publications Committee
1994-1995	Society of Magnetic Resonance in Medicine	Education Committee
1994-1995	Society of Magnetic Resonance in Medicine	Chair, Student Stipend Committee
1994-	International Society of Magnetic Resonance in Medicine	Member
1995-1996	International Society of Magnetic Resonance in Medicine	Board of Trustees
1995-1998	Organization for Human Brain Mapping	Advisory Council
1995-1997	International Society of Magnetic Resonance in Medicine	Member
1995-	International Society of Magnetic Resonance in Medicine	Education Committee
1997-1999	Organization for Human Brain Mapping	Treasurer
1997-	Radiological Society of North America	Scientific Advisor
2015	National Academy of Medicine	Member

Grant Review Activities

Editorial Activities

Magnetic Resonance in Medicine (1984-present)
 Circulation (1985-present)
 Radiology (1985-)
 American Journal of Roentgenology (1987-present)
 Science (1989-present)
 American Journal of Neuroradiology (1990-present)
 Journal of Magnetic Resonance Imaging (1992-present)
 Journal of Cerebral Blood Flow and Metabolism (1992-present)

Nature (1993-present)

Neuron (19 -2016)

Physics Division Review Committee, Los Alamos National Laboratory (2003-present)

Other Editorial Roles

1987-1995	Editorial Board	Journal of Computer Assisted Tomography
1990-	Editorial Board	Magnetic Resonance Imaging
1993-2004	Associate Editor	Human Brain Mapping
1996-	Editorial Board	Neuron
1991-2001	Editorial Board	Neuropsychopharmacology
2007-2009	Editorial Board	Brain Imaging and Behavior
2008-	Editorial Board	Reports in Medical Imaging
2015-	Executive Advisory Editor	Convergence in Cancer Research
2015-	Editorial Board	Tomography

Honors and Prizes

1974	John Harvard Scholarship	Harvard University
1977	Phi Beta Kappa	Harvard University
1983	Sigma Xi	MIT Chapter of the Scientific Research Society
1997	Gold Medal	International Society for Magnetic Resonance in Medicine
1999	Fellow	International Society for Magnetic Resonance in Medicine
2006	Fellow	American Institute for Medical and Biological Engineering
2010	Member	Institute of Medicine of the National Societies
2011	Distinguished Researcher	Radiological Society of North America (RSNA)
2011	KFJ Prize	Rigshospitalets Internationale KFJ-pris
2012	Thomas A. McMahon Mentoring Award	Harvard-MIT Health Sciences and Technology
2012	Council of Distinguished Investigators	Academy of Radiology Research
2016	Member	American Academy of Arts and Sciences
2017	Most Influential Radiology Researcher	Aunt Minnie.com Best & Brightest in Medical Imaging

Report of Funded and Unfunded Projects

Funding Information

Past

1986-1989	Angiography of Atherosclerosis Using Magnetic Resonance NIH/NHLBI, R01HL37003 Principal Investigator
1988-1990	MR of Body Fat, Ovulation and Estrogen Metabolism NIH/NICHD, R01HD23536 Subcontract Principal Investigator
1988-2011	Perfusion Imaging with Magnetic Resonance NIH/NIBIB, R01EB002066

1989-2002 Principal Investigator
 Biomedical Implication of Magnetic Susceptibility
 NIH/NCI, P01CA48729
 Investigator (Thomas J. Brady, PI)

1991-1992 Contrast Enhanced MRI of Central Nervous System in Adults by Intravenous
 Administration (Gadodiamide Injects)
 Sterling Pharmaceuticals
 Principal Investigator

1992-1994 Quantitation of Blood Flow in Cerebral Ischemia
 Bracco Pharmaceuticals
 Principal Investigator

1992-1995 Quantitation of Blood and Blood Tumor Barrier Permeability as a Function of Molecular
 Size
 Bracco Pharmaceuticals
 Principal Investigator

1993-1995 Functional Neuroimaging by MRI: Human Visual System
 NIH/NIMH, R01MH50054
 Co-Principal Investigator

1993-1994 Biospec 30/60 3T In Vivo
 NIH/NCRR, S10RR08255
 Principal Investigator

1994-1995 Segmentation/Presentation Techniques for Brain Tumors and Analysis of Brain Tumor
 Volumes on Patients Treated with PRS
 Photoelectron Corporation
 Principal Investigator

1994-1996 Sprodiamide CBV Data: 59080-006
 Nycomed
 Principal Investigator

1994-1997 MRI Spectroscopy of Lactate in Huntington's Disease
 NIH/NINDS, R01NS32365
 Investigator (Flint Beal, PI)

1994-1999 NMR Proton Chemical Shift Imaging
 NIH/NCI, R01CA40303
 Principal Investigator

1994-2005 Functional Brain Mapping of Cocaine Addiction" Core C, Project 1
 NIH/P01DA09467
 Principal Investigator

1995-1996 MacArthur Developmental fMRI Consortium-MGH Component
 MacArthur Foundation
 Principal Investigator

1995-1997 Clues to the Pathophysiology of Cognitive Decline in Parkinson's Disease
 Charles A. Dana Foundation
 Co-Principal Investigator (Suzanne Corkin, PI)

1995-1998 Anatomic Morphologic Analysis of MR Brain Images
 NIH/NINDS, R01NS34189
 Investigator (David N, Kennedy, PI)

1996-1999 Neurodevelopmental Basis of Learning Disabilities
 NIH/NICHD, P50HD33803

1996-2001 Project Leader, Project #4 (Debra Waber, PI)
 Spatial and Temporal Patterns in Functional Neuroimaging
 NIH/NIMH, P20MH57180
 Principal Investigator

1996-2006 Pathophysiology and Treatment Mechanisms
 NIH/NINDS, P01NS35611
 Investigator (Michael Moskowitz, PI)

1997-1998 Human Tinnitus Studied with Functional MRI
 NIH/NIDCD, R01DC03255
 Investigator

1997-1999 Quantitation of Blood Volume during Brain Activation
 Bracco Pharmaceuticals
 Investigator (Bruce G. Jenkins, PI)

1997-2000 Theoretical Analysis of Learning in Age-Related Disease
 NIH/NIA, R01AG06605
 Investigator (Suzanne Corkin, PI)

1998-1999 fMRI Investigations of Functional Reorganization of Human Visual Cortex After
 Recovery from Occipital Stroke
 Charles A. Dana Foundation
 Co-Principal Investigator (Nancy Kanwisher, PI)

1998-2001 Perfusion Imaging with Magnetic Resonance
 NIH/NHLBI, R0139810
 Principal Investigator

1999-2001 fMRI of Cocaine Effects in Cocaine Abusive Schizophrenics
 NIH/NIDA, R21DA11229
 Investigator (Randy Gollub, PI)

1999-2004 Interdepartmental Stroke Program
 NIH/NINDS, P50NS10828
 Investigator (Michael Moskowitz, PI)

1999-2007 Spatiotemporal Activation maps of Human Cortex by Integrating
 MEG with MRI
 MIND Institute
 Principal Investigator

2000-2005 Changes in HIV: an fMRI Study
 NIH/NINDS, R01NS40239
 Subcontract Principal Investigator

2000-1914 Center for Functional Neuroimaging Technologies
 NIH/NCRR< P41RR014075
 Principal Investigator

2002-2007 Spatiotemporal Brain Imaging: Microscopic and Systems Level
 NIH/NIBIB, R01EB00790
 Principal Investigator

2002-2010 BIRN Functional Imaging Project: MGH Site-Supplement to P41
 NIH/NCRR
 Principal Investigator

2003-2011 Neuroimaging Acupuncture Effects on Human Brain Activity
 NIH/NCCAM, P01AT002048
 Principal Investigator

2003-2006 Validating High-Field Functional and Structural MRI for Circuitry –Based Phenotyping to Drive Genotyping of Heritable Components Leading to Cocaine Addiction and Mood Disorders
ONDCP
Investigator (Hans Breiter, PI)

2004-2005 Clinical and Brain Reward Circuitry Effect of Risk
Jansen Pharmaceutical
Investigator (David Gasfriend, PI)

2004-2007 Cyclotron and Radiochemistry Modules
NIH/NCRR, S10RR01728A01
Principal Investigator

2005-2009 Feasibility of Rehabilitation in Robots
NIH/NIBIB, R21EB004665
Investigator (Aria Tzika, PI)

2004-2009 Contextual Predictions Facilitates Visual Cognition
NIH/NINDS, R01NS5050615
Investigator (Moshe Bar, PI)

2004-2009 Morphometry Biomedical Informatics BIRN: MGH Site
NIH/NCRR, U24RR021382
Principal Investigator

2006-2010 BIRN Functional Imaging Project: MGH Site
NIH/NCRR, U24RR021992
Principal Investigator

2008-2013 Clinical and Translational Research Center
NIH/NCRR, UL1RR025758
Principal Investigator

2009-2010 Center for Functional Imaging Technologies Administrative Supplement
NIH/NCRR, P41RR014075
Principal Investigator

2009-2011 Radiochemist for Drug Abuse PET Probe Development
NIH/NIDA, P30DA028800
Principal Investigator

2009-2011 Creating a Pediatric Imaging Genomics Data Resources
NIH/NIDA, RC2DA029475
Subcontract PI (Anders Dale, UCSD, PI)

2009-2012 Core Center for Multimodal Evaluation of Acupuncture Mechanisms
NIH/NCCAM, P30AT005895
Principal Investigator

2009-2013 Collaborative Tools Support Network for the BIRN
NIH/NCRR, U24RR026057
Principal Investigator

2009-2014 Neuroimaging Leadership for the PTSD-TBI Clinical Consortium
DOD
Subcontract PI (Martha Shenton, Harvard PI)

2009-2014 Bioinformatics Research Network Coordinating Center
NIH/NCRR, U24RR025736
Subcontract PI (Carl Kesselman, USC, PI)

2009-2014 Cortical Pathology and its Correlates in Multiple Sclerosis by Ultra High Field MRI

NMSS MSRG 4281-A-1
Investigator (Caterina Mainero, PI)

2009-2014 Simultaneous PET/MR Imaging of the Degeneration of Dopamine Structural and Functional Brain Networks and Associated Cognitive Domains in Mild TBI
Subcontract PI (Regina McGlinchey, VA Boston Healthcare System, PI)

2013-2015 Neuroimaging Leadership for the PTSD-TBI Clinical Consortium
DOD, W81XWH-08-2-0159
Investigator (Shenton PI, Rosen PI sub)

2003-2015 Neuroimaging Training Program
NIH/NIBIB, T32EB001680
Principal Investigator

2006-2016 Advanced Multimodal Neuroimaging Training Grant
NIH/Blueprint, (NIDA), %90DA022759
Principial Investigator

2006-2016 Advanced Multimodal Neuroimaging Training Grant
NIH/Blueprint, (NIDA), R90DA023427
Principial Investigator

2010-2016 The Human Connectome Project
NIH/NIMH, U01MH093765-16
Principal Investigator

2011-2017 Neuroimaging Acupuncture Effects of Brain Activity in Chronic Low Back Pain
NIH/NCCAM, P01AT06663
Principal Investigator

2011-2017 Advanced Multimodal Neuroimaging Training Grant
NIH, 5R90DA023427-10
Principal Investigator

2011-2017 Advanced Multimodal Neuroimaging Training Grant
NIH, 5T90DA022759-10
Principal Investigator

2017-2017 Brain inflammation and cognitive decline in HIV patients with dysbiotic microbiom
Campbell Foundation
Granziera / Rosen – Overseer

2007-2018 Angiogenesis-Targeting Therapy For Glioblastoma
NIH/NCI, 2R01CA129371-06
Investigator (Batchelor-PI)

2011-2018 Quantitative MRI of Glioblastoma Response
NIH, 5U01CA154601-05
Investigator (Kalpathy-Cramer-PI)

2013-2018 Targeted Therapies of Glioma
NIH, 1 P50CA165962-01A1
Investigator (Bathelor-PI)

2014-2019 Transformative Restoration of Affective Networks by Systematic Function-Oriented, Real-Time Modeling and Deep Brain Stimulation (TRANSFORM)
DOD-DARPA SUBNETS
Investigator (Eskandar)

2014-2019 Center for Functional Imaging Technologies
NIH, 5P41EB015896-18
Principal Investigator (Rosen- PI)

2014-2019 Informatics Tools for Optimized Imaging Biomarkers for Cancer Research & Discovery
 NCI/NIH, 5U24CA180927-03
 Investigator (Rosen/Kalpathy-Cramer-Multi-PD/PI)

2015-2020 2/13 ABCD-USA Consortium: Data Analysis Center
 NIH, 5U24DA041123-02
 Investigator (PI of S/C-Rosen)

2016-2020 Integrated Multichannel System for Transcranial Magnetic Stimulation and Parallel
 Magnetic Resonance Imaging
 NIH, 1R01MH111829-01
 Investigator (Nummenmaa)

2016-2021 Resting State connectivity: Biophysical basis for and improved fMRI Measurements
 NIH, 1R01MH111438-01
 Investigator (Rosen PI Sub / Kleinfeld PI Prime UCSD)

2017-2022 Nutrition Obesity Research Center at Harvard (NORCH)
 NIH/NIDDK, 2P30 DK040561
 Investigator (Grinspoon)

2018-2020 Lifeling Learning Forests
 Johns Hopkins University, FA8650-18-2-7834
 Investigator (Rosen, Bruce R)

2018-2023 Evaluation of brain recovery of stroke patients using a novel magnetic resonance hand
 robotic device combined magnetic resonance imaging
 NIH, 1R01NS095936-01
 Investigator (Tzika)

2014-2020 Center for Functional Imaging Technologies
 NIH, 5P41EB015896-20
 Principal Investigator (Rosen- PI)

2015-2025 Neuroimaging Training Program
 NIH/NIBIB, T32EB0011680-15
 Co-Program Director (Rosen/Gollub)

2017-2022 Program in Recovery and Restoration of CNS health and function
 NIH-NINDS, 5T32NS100663-03
 Faculty (Rosand, Jonathan)

2017-2022 Training in Drug Abuse and Brain Imaging
 NIH-NIDA, 5T32DA015036-18
 Faculty (Lukas, Scott E)

2019-2022 CZI High Resolution Optical Imaging Core
 Chan Zuckerberg Initiative, 2019-198101
 Principle Investigator (Rosen, Bruce R)

2019-2022 Transforming Clinical Research for Brain Health: Bruce Rosen Fund
 Massachusetts Life Sciences Center
 Project PD/PI (Rosen, Bruce R)

2016-2022 Resting State connectivity: Biophysical basis for and improved fMRI Measurements
 NIH, 5R01MH111438-03
 Investigator (Rosen PI Sub / Kleinfeld PI Prime UCSD)

2020-2021 Bridging the cellular and microvascular anatomy and functional dynamics: Upgrade the
 14T horizontal MR for rodent and ex-vivo imaging
 NIH, S10MH124733
 Investigator (Rosen)

2020-2023 Pilot Study of Long-Term Effects of Repetitive, Low-Level Blast Exposure (RLLBE) on Special Operations Forces (SOF) Service Members (ReBlast-2)
S.C. to University of South Florida, H9240520D0001
Investigator (Edlow, Brian L)
Upgrade the 14T Ultrahigh Field Horizontal MR Scanner for Rodent ad ex-vivo imaging
NIH, 1S10OD028616-01A1

Current

2018-2025 Boosting mind-body mechanisms and outcomes for chronic pain
NIH, 5P01AT009965-05
Investigator (Napadow, Rosen)

2018-2025 Connectome 2.0: Developing the next generation human MRI scanner for bridging studies of micro-, meso-, and macro-connectome
NIH, 5U01EB026996-05
Investigator (Huang/Rosen)

2020-2025 Brainstem-based imaging biomarkers of premanifest synucleinopathy
NIH, 5R01AG063982-05
Investigator (Bianciardi, Marta)

2020-2026 Development of the Human Dynamic Neurochemical Connectome Scanner
NIH, 5U01EB029826-04
Investigator (Catana)

2020-2025 Center for Mesoscale Mapping
NIH, P41EB030006-05
PD/PI (Rosen, Bruce R)
Investigator (Rosen, Bruce R)

2021-2026 Local neuronal drive and neuromodulatory control of activity I the pial neurovascular circuit
Trustees of Boston University subcontract, 51U19NS123717-04
PD/PI-BU/Rosen PI MGH

2021-2026 Neuroimaging Training Program
NIH, T32EB001680- 15
PD/PI: Rosen/Gollub

2022-2027 **Nutrition Obesity Research Center at Harvard (NORCH)** Metabolic Imaging Core – 3
NIH, 5P30DK040561-28
PD/PI: Rosen, Bruce R

2021-2025 Upgrade the 14T Ultrahigh Field Horizontal MR Scanner for Rodent and ex-vivo imaging
ECOR
PD/PI: Rosen, Bruce R

2023-2025 Multi-modal imaging of the metabolic and neurochemical mechanisms underlying task-evoked negative BOLD signals,
1R21MH135201-01
PD/PI: Chen, Jingyuan E

2024-2027 Improving Recruitment, Engagement, and Access for Community Health Equity for

BRAIN Next-Generation Human Neuroimaging and Beyond (REACH for BRAIN
NIH, 1R01MH134144-02

PD/PI: Shen, Rancis; Jackson, Jonathan, Huang, Susie Y

2024-2029 Connectome 2.0: A BRAIN Technology Integration and Dissemination Resource for Ultra-
High Gradient Magnetic Resonance Imaging of Human Brain Circuits Across Scales

NIH, 1U24NS137077-01

PD/PI: Huang, Susie Y

Current Unfunded Projects

2017-2022 NeuroNex Technology Hub: Towards The International Brain Station for Accelerating and
Democratizing Neuroscience Data Analysis and Modeling

NIH/NSF, 16-569

Investigator (Johns Hopkins University)

2017-2022 Validation of Small-Vessel Disease Neuroimaging Biomarkers in Cerebral Amyloid
Angiopathy-Related Cognitive Decline

NIH, R01

Investigator (Viswanathan)

2018-2023 Clinical and translational applications of quantitative imaging tools in brain tumors

NIH

Investigator (Kalpathy-Cramer)

2018-2023 Integrating multiscale modeling with multimodal imaging to predict drug delivery

NIH, U01

Investigator (Rosen)

2025-2029 Evaluation of Brain Recovery in Stroke Patients: A Novel Approach Utilizing a Magnetic
Resonance-Compatible Foot-Induced Robotic Device Combined with Magnetic Resonance
Imaging

NIH

PD/PI: Tzika, Aria A

2025-2029 Using Vascular Architecture Imaging to Understand Neuron Loss in Alzheimer's Disease

NIH

PD/PI: Bennett, Rachel E

2024-2029 Characterizing microvascular impairment in adults with elevated genetic risk for
Alzheimer's disease

NIH, 1R01AG086263-01A1

PD/PI: Juttukonda, Meher R

2025-2030 Non-invasive imaging of pathological fibrin deposition and its effect on progressive
neurodegeneration in the human brain: an in vivo longitudinal study

NIH, 1R01NS138305-01A1

PD/PI: Mainero, Caterina

2025-2030 Center for Mesoscale Mapping

NIH, P41EB030006

PD/PI: Rosen, Bruce R

2025-2030 Augmenting inhibitory control through real-time alpha-band MEG neurofeedback as a
prevention for subclinical anxiety in children

Regents of the University of New Mexico

PD/PI: Ahlfors, Seppo

2025-2030 Quantitative Imaging of Lung Perfusion and Ventilation

NIH,
PD/PI: Zhou, Yuwen I

Report of Local Teaching and Training

Teaching of Students in Courses

1985-	Magnetic Resonance-Analytic, Biochemical, and Imaging Techniques	MIT, Division of Health Sciences and Technology Course Instructor, 15-unit graduate level course, ~20 students (8 hrs per week)
1988-	Neuroradiology and Head and Neck Radiology	Massachusetts General Hospital Course Instructor
1992-	Human Nervous System and Behavior	Harvard Medical School Course Instructor
1993-	Introduction to Neuroscience	Harvard Medical School Lecturer, 100 medical students
1996-2008	Freshman Advisor Seminar-Career Options for Biomedical Research	MIT, Department of Nuclear Engineering Course Developer & Lecturer, 12 freshman students

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

1987-1993	Core Clerkship in Diagnostic Radiology	Harvard Medical School, Massachusetts General Hospital Course Instructor
1988-	Physics of Imaging for Radiology Residents	Harvard Medical School, Massachusetts General Hospital Course Instructor
1994-	Mini Course, Radiology Residency Program	Massachusetts General Hospital Lecturer
1998-	Neurology Resident Neuroscience Lecture Series	Massachusetts General Hospital, Brigham and Women's Hospital, West Roxbury VA Neurology Lecturer
2008	Brain and Cognitive Sciences	MIT
2008	Imaging Biophysics and Clinical Applications	MIT Lecturer
2010	Introduction to Clinical Investigation	Harvard Medical School Lecturer
2015	Frontiers in Biomedical Engineering and Physics	Lecturer / MIT
2015	Intro to fMRI	Lecturer / MIT
2016	Frontiers in Biomedical Engineering and Physics	Lecturer / MIT
2016	Flow and Diffusion Imaging	Lecturer / MIT
2017	Frontiers in Biomedical Engineering and Physics	Lecturer / MIT

2017	Intro to fMRI	Lecturer / MIT
2019	fMRI Introduction and future applications	Lecturer / MIT
2024	Introduction to fMRI	Lecturer / MIT

Clinical Supervisory and Training Responsibilities

Laboratory and Other Research Supervisory and Training Responsibilities

2009-	Prehealth Advisory Board, MIT
2009-	MEMP Academic Advisor, MIT/HST

Formally Supervised Trainees

PhD Students

- 1986-1988 Daisey Chien, PhD, MIT
Cardiac MR Research and Development, Cedars-Sinai Medical Center
- 1986-1988 David Kennedy, PhD, Harvard
Professor of Psychiatry, University of Massachusetts, Director, Division of Neuroinformatics, Child and Adolescent
- 1986-1990 John W. Belliveau, PhD, Harvard
Associate Professor, Harvard Medical School
- 1987-1993 Bernice Hoppel, PhD, MIT
Sr. Clinical Research Applications Scientist, Toshiba Medical Research Institute USA
- 1987-1992 Michelle (Neuder) Bradbury, PhD, MD, MIT
Physician-Scientist, Memorial Sloan-Kettering Research Institute
- 1988-1997 Timothy Davis, MD, PhD, MIT
Medical Director of Radiology, St. Vincent St. Joseph Hospital, Kokomo, IN
- 1988-1991 Son Kim, MS, PhD, MIT
Sr. Research Scientist, Joint Global Change Research Institute, Pacific Northwest National Laboratory
- 1989-1993 Robert McKinstry, MD, PhD, MIT
Professor of Radiology, Washington University School of Medicine, St. Louis
- 1989-1998 Thomas M. Talavage, PhD, MIT
Associate Professor, Electrical & Computer Engineering, Weldon School of Biomedical Engineering, Purdue University; Co-Director, Purdue MRI Facility
- 1994-1997 Joelle Dennie, MS, MIT
Physician, Canada
- 1996-2003 Fa-Hsuan Lin, PhD, HST
Assistant Professor of Radiology, Harvard Medical School
- 1997-2002 Scott Packard, BA, Cornell University; PhD, MIT
Sr. Vice President, Research Services, MedPanel
- 2001-2009 Shuning Huang, MS, Yale University; PhD, MIT
Research Fellow, Massachusetts General Hospital
- 1999-2007 Megan Hepler Blackwell, PhD, HST
Sr. Technical Editor, MIT Lincoln Laboratory
- 1999-2007 Francisca Leite, PhD, MIT
Consultant, McKinsey & Co., Lisbon, Portugal
- 2002-2007 Mark Haig Khatchaturian, PhD, MIT
Systems Engineer, Diagnostic Imaging, GE Healthcare
- 2001-2007 Avniel Ghuman, PhD, Harvard
Postdoc, Laboratory of Brain and Cognition, Division of Intramural Research Programs, National Institute of Mental Health
- 2008- Audrey Peiwen Fan
PhD Student, Electrical Engineering and Computer Science, MIT
- 2007-2011 Nam-Hee Kim, PhD
Associate Professor of Neurology at Dongguk University, Graduate School of Medicine, Ilsan Hospital
Department of Radiology, MGH

2008-2014 Daniel Chonde
PhD Student, Biophysics, HST, MIT

2009-2016 Bo Zhu
PhD Student, Speech and Hearing Biosciences, HST

2010-2015 Christin Sander
PhD Student, Bioelectrical Engineering, MIT

2015- Manuel Anotonio Morales, PhD, HST

2016-2021 John Samuelsson, PhD Student, HST

2016-2020 Fuyixue Wang, PhD Student, HST, MIT

2018- Katharina Hoebel, PhD Student, HST, MIT

2020- Magdalina Suriano Allen, PhD Student, MIT Physics

MD Students

1987-1989 A. Gregory Sorensen, MD
CEO, Siemens Healthcare, USA
Professor in Radiology, Harvard Medical School

2007-2010 Susie Huang, PhD
Medical student, HST

2016-2022 Ken Chang, PhD
Medical student, HST, MIT

PhD and MD Postdoctoral Fellows

1986-92 Kenneth Kwong, PhD
Associate Professor in Radiology, Harvard Medical School, Assistant in Physics, MGH

1987 Arno Villringer, MD
Professor of Neurology, Charité Neurological Hospital and Humboldt University, Berlin, Germany

1988-1991 Bradley Buchbinder, MD
Instructor in Radiology, Harvard Medical School

1989-1990 A. Gregory Sorensen, MD
CEO, Siemens Healthcare, USA
Professor in Radiology, Harvard Medical School

1989-1990 Elizabeth Gerard, MD
Assistant Professor, Mallinckrodt Institute

1990 Romeo Dominguez, MD
Private Radiology practice, Brazil

1990-1991 Lynn Johnson, MD
Radiologist, UCSD

1990-1993 Hannu Aronen, MD
Associate Professor, Department of Radiology, University of Helsinki, Finland

1990-1992 John W. Belliveau, PhD
Associate Professor of Radiology, Harvard Medical School, Assistant in Physics, MGH

1990-1993 Leen Porka (Hamberg), PhD
Associate Professor of Radiology, Department of Diagnostic Radiology/Neuroradiology, MD Anderson Cancer Center

1990-1993 Bruce R. Jenkins, PhD
Instructor in Radiology, Harvard Medical School, Assistant in Physics, MGH

1990-1995 Christian Farrar, PhD

1991-1993 Instructor in Radiology, Harvard Medical School, Assistant in Neuroscience, MGH
 Inna Goldberg, MD
 Assistant Professor in Radiology, Tufts University School of Medicine
 1991-1994 John Baker, MD, PhD
 Bon Secours Neurovascular Center, Bon Secours DePaul Medical Center, Norfolk, VA
 1991-1996 Chantal Stern, D.Phil
 Professor, Psychology and Neurosciences Program and Director, Cognitive Neuroimaging
 Laboratory, Boston University
 1996-1996 Randall Benson, MD
 Assistant Professor of Neurology, Wayne State University School of Medicine
 1992-1996 Francesca Caramia, MD
 Chair of Neuroradiology, University of Rome La Sapienza
 1993-1994 Sarah Kulke, MD
 Medical Director, Genzyme
 1993-1994 Roland Brüning, MD
 Assistant Professor of Radiology, university of Munich, Germany
 1993-1996 Kathleen (Donahue) Schamainda, PhD
 Professor of Radiology, Medical College of Wisconsin
 1993-1997 Aiping Jiang, PhD
 Aurora Imaging Technology
 1994-1996 Peter Bandettini, PhD
 Chief, Unit of Functional Imaging, NIH National Institute of Mental Health
 1994-1996 Leif Østergaard, MD, PhD
 Professor and Director, CFIN/MINDLab, Aarhus University, Denmark
 1994-1996 Anders Dale, PhD
 Professor, UCSD Department of Neuroscience and Radiology; Co-Director, Multimodal
 Imaging Laboratory, UCSD
 2003-2007 Dahlia Sharon, PhD
 Social Science Research Associate, Stanford University
 1995-2001 Young Ro Kim, PhD
 Assistant Professor of Radiology, Harvard Medical School, Assistant in Neuroimaging,
 MGH
 1995 Michael Lev, MD
 Associate Professor in Radiology, Harvard Medical School
 1996 Stephan Brandt, MD
 Senior Consultant, Clinic for Neurology and Berlin Neuroimaging Center, CCM, Charité
 University Hospital, Berlin, Germany
 1997-1997 Randy Lee Buckner, PhD
 Professor, Departments of Psychology and Neuroscience, Harvard University
 Director, Psychiatric Neuroimaging Research Program, Massachusetts General Hospital
 1997-1999 Richard Dale Hoge, PhD
 Assistant Professor in Physiology and Radiology, University of Montreal
 1997-2002 Scott Dewitt Packard, PhD
 Senior Vice President, Research, MedPanel
 1998-2003 Christopher Moore, PhD
 Associate Professor, Department of Brain and Cognitive Sciences, MIT
 2002-2005 Melina Pectasides, MD
 Clinical Fellow in Radiology, Massachusetts General Hospital

2002-2007 Christina Liu, PhD
Program Officer, NIH National Center for Research Resources

2003-2008 Caterina Mainero, MD, PhD
Instructor in Radiology, Harvard Medical School, Assistant in Neuroscience, MGH

2009- Julien Cohen-Adad, PhD
Laboratoire d'Imagerie Fonctionnelle, University of Paris

1990-1995 Christian Farrar, PhD
Instructor in Radiology, Harvard Medical School, Assistant in Neuroscience, MGH

2002-2007 Robert Haslinger, PhD
Instructor in Radiology, Harvard Medical School, Assistant in Neuroscience, MGH

2009-2012 J. Jean Chen, PhD
Research Fellow, Martinos Center

2018-2019 Laura Lewis, PhD
Instructor in Radiology, Harvard Medical School, Instructor in Investigation, MGH

2020- Jingyuan chen, PhD
Instructor in Radiology, Harvard Medical School, Instructor in Investigation, MGH

2020- Fuyixue Wang, PhD
Instructor in Radiology, Harvard Medical School, Instructor in Investigation, MGH

Formal Teaching of Peers (e.g., CME and other continuing education courses)

1985-	Magnetic Resonance Imaging Harvard Medical School Continuing Medical Education Course Co-Director	Preparation time: 5-8 hrs 150-250 attendees
1989	Massachusetts General Hospital Magnetic Resonance Imaging Visiting Fellowship Program Lecturer	2 lectures in 4 sessions per year Preparation time: 1 hr per session 10 attendees
2005	MRI and MRS Institute for Magnetic Resonance Research, Cairns, Australia Speaker	
2007-2008	Advanced Neuroimaging Techniques, Current and Future Applications Harvard Medical School Continuing Medical Education Course Co-Director	Preparation time: 6 hrs 60-85 attendees
2010	MRI 2010 Clinical Updates and Practical Applications Harvard Medical School Continuing Medical Education	Preparation time: 20 hrs 55 attendees
2012	MRI 2012 Clinical Updates and Practical Applications Harvard Medical School Continuing Medical Education	Preparation time: 44 attendees

Local Invited Presentations

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

Regional

2004	Speaker, CIMIT, "Functional Imaging of the Brain", Boston, MA
2004	Speaker, Palliative Care Grand Rounds, "Functional MRI: Current Research, Massachusetts General Hospital
2007	Keynote speaker, HST Forum 2007 "Imaging is Everything" Charlestown, MA
2008	Speaker, MIT, 50 th Anniversary Symposium, Development of Brain Imaging in the Next Few Decades
2008	Speaker, Joint Program in Nuclear Medicine, Harvard Medical School, Department of Radiology, Multimodal Brain Imaging
2009	Longwood Neurology Grand Rounds, "Multimodal Neuroimaging", Beth Israel Deaconess Medical Center
2010	Keynote speaker, "Lessons Learned", Massachusetts General Hospital, Partners Radiology Research and Education Retreat

- 2012 Stanford CME Radiology Grand Rounds, “MR/PET, And Other Cool Things”, Stanford School of Medicine
- 2012 50th Annual Sosman Lecture, “fMI: Has It Changed The World”, Brigham and Women’s Hospital, Radiology Grand Rounds
- 2013 Speaker, CME Cancer Center Grand Rounds, “Advances in Functional and Molecular Imaging Using MRI and PET, Massachusetts General Hospital
- 2013 Keynote speaker, Communications and Digital Signal Processing Center Workshop, “Making Sense of the Connectome: New Tools and Approaches, Northeastern University
- 2013 Keynote speaker, “Key Advancements in Medical Imaging”, Optical Coherence Tomography Symposium, Massachusetts General Hospital
- 2016 Speaker, McLean Imaging Center Speaker Series, “The Power of Multitmodal Imaging Approaches to Study Psychiatric and Medical Disorders.”, McLean Hospital, Belmont, MA
- 2017 Speaker, Acoustical Society of America, "Approaches to pushing the limits of human brain imaging", Boston, MA
- 2018 Speaker, Harvard’s Presidential Inauguration, Cambridge, MA
- 2018 Speaker, “Innovation in Human Imaging”, MBB/HBI Neuroscience Symposium, Cambridge, MA
- 2018 Speaker, “Challenges and Opportunities for Advanced Neuroimaging”, Biophysics Mini-Symposium, Harvard University
- 2019 Speaker, CME Boston Medical Center Neurology Clinical Grand Rounds, “Frontiers in Human Neuroimaging”, Boston, MA
- 2024 Speaker, CME Mass General Neuroscience Grand Rounds, “Historical Perspectives, 30 Years of Functional MRI”, Boston, MA

National

- 1992 Plenary Speaker, “Imaging Symposium: MRI Vignettes”, Radiological Society of North America, Chicago
- 1996 Co-Chair, “Functional MR Imaging”, International Society of Magnetic Resonance in Medicine, New York, NY
- 1996 Lecturer, Dean’s Hour, Cornell University Medical College
- 1996 Speaker, “Imaging the Living Human Brain”, Frontiers in Science Meeting, National Academy of Sciences
- 1996 Plenary Lecturer, “Functional Imaging with EPI”, Radiological Society of North American, Chicago
- 1996 Speaker, Cognitive Functional and Drug Abuse, National Institute on Drug Abuse
- 1997 Speaker, “Functional MR Imaging of Brain Tumors”, 40th Annual Clinical Conference, Cancer and the Central Nervous System, MD Anderson Cancer Center
- 1997 Speaker, “Calibrated Functional MRI: Mapping the Dynamics of Oxydative Metabolism”, National Academy of Sciences, Neuroimaging of Brain Function Meeting
- 1997 Plenary Lecture “Functional Magnetic Resonance Imaging”, Brain 97 Meeting, Johns Hopkins Medical Institutions
- 1997 Speaker, Short Course One - Brain Imaging, Society of Neuroscience Meeting, New Orleans, LA
- 1997 Co-Chair of Special Focus Session “Optical Tomography at the Threshold”, Radiological Society of North America, Chicago

- 1998 Speaker, American Psychosomatic Society Meeting, Clearwater, FL
- 1998 Speaker, 21st Princeton Conference, St. Louis, MO
- 1998 Speaker, J.P. Morgan & Cold Spring Harbor Laboratory Executive Conference, Banbury Center, NY
- 1998 Moderator, “Functional MRI in Stroke”, Radiological Society of North America, Chicago
- 1999 Speaker, Conference on the Joint Working Group on Quantitative in vivo Functional Imaging in Oncology, Washington, DC
- 1999 Speaker, Brain Mapping Addiction Neurobiology Conference, UCLA
- 1999 Speaker, ONDCP International Technology Symposium, Washington, DC
- 1999 Speaker, “Spatiotemporal Functional Imaging of the Brain”, Brookhaven National Laboratory, Upton, NY
- 1999 Speaker, Neuroimaging: Glimpses into the Working Brain, National Institutes of Health, Bethesda, MD
- 1999 Speaker, Kirby Symposium on Functional Brain Imaging, Kennedy Krieger Institute, Baltimore, MD
- 1999 Co-moderator, Metabolic Responses Underlying fMRI, ISMRM Meeting, Philadelphia, PA
- 1999 Speaker at the Dedication of the Sackler Institute for Developmental Psychobiology, New York, NY
- 1999 Speaker, Understanding Our Selves, The Science of Cognition, Library of Congress/NIMH Conference, Washington, DC
- 1999 Speaker AACR-NCI-EORTC Meeting, Washington, DC
- 1999 Speaker, “Clinical applications of functional imaging” National Foundation for Functional Imaging, Albuquerque, NM
- 2000 Speaker, American Society of Neuroradiology, Atlanta, GA
- 2000 Co-Chair, Oral Scientific Session “Perfusion: Contrast Agent Based Methods”, International Society of Magnetic Resonance in Medicine, Denver, CO
- 2000 Public Talk, “Imaging: The Working Brain”, Organization for Human Brain Mapping, San Antonio, TX
- 2002 Speaker, Eugene P. Pendergrass New Horizon Lecture, RSNA, Chicago
- 2004 62nd Annual Scientific Meeting of the American Psychosomatic Society, “Brain-Body Interactions: Insights into New pathways from Neuroimaging”, Orlando, FL
- 2004 24th Princeton Conference on Cerebrovascular Disease, “What is the Future of Multimodal Imaging in Stroke”, Baltimore, MD
- 2004 Neuhauser Lecture, Annual Meeting of the Society for Pediatric Radiology, New Advances in MRI: A Guide for the Practicing Pediatric Radiologist, Savannah, GA
- 2004 Speaker, IEEE, International Symposium on Biomedical Imaging, “Multi-Modal Imaging of the Brain”, Arlington VA
- 2005 Course Co-Chair and Speaker, Functional fMRI Primer Practical Considerations for Successful fMRI, International Society for Magnetic Resonance in Medicine, Miami, FL
- 2006 Speaker, “Modern Science Explores Ancient Practice”, NCCAM Distinguished Lectures in the Science of Complementary and Alternative Medicine, Bethesda, MD
- 2006 Speaker, Berlex Summit. “Trends in functional imaging”
- 2006 Speaker, Stanford Symposium on Clinical High Field MRI, “Advance in Diffusion and Tissue Characterization in the Brain”
- 2006 Keynote speaker, ED Innovation in Technology and Science Day, Novartis/East Hanover, NJ
- 2007 Speaker, “What Imaging Tools May be Utilized for the Development of/ Biomarkers for

- Nervous Systems Diseases?" Institute Of Medicine, Biomarkers Workshop, Washington, DC
- 2007 Speaker, "Novel Approaches to Imaging the Aging Brain", OHBM, Chicago, IL
- 2007 Speaker, "Novel Approaches to Imaging the Aging Brain", American Society for Neuroradiology, Chicago, IL
- 2008 NINDS Research Lecture Series, Washington University, Frontiers in Multimodal Brain Imaging, St. Louis, MO
- 2008 Bio-X-Frontiers in Interdisciplinary Biosciences Program, Stanford University, "Frontiers in Multimodal Brain Imaging", Palo Alto, CA
- 2008 Keynote Speaker, MRI Symposium, "Window into the Mind: Visualizing Brain Function and Dysfunction Using MRI, Brown University, Frontiers in Multimodal Brain Imaging", Providence, RI
- 2008 Speaker, Columbia University, Biomedical Engineering Colloquium, Multimodal Functional Imaging, New York, NY
- 2008 Speaker, MIT Portugal Program 2008, Coimbra, Portugal, Clinical Applications of Neuroimaging
- 2008 Speaker, Founders Lecture, "Multimodal Imaging of the Brain", Vanderbilt University Institute of Imaging Science
- 2008 Speaker, 7th Annual Symposium of High Field MRI, Emerging High Field Applications in Neurologic Disease, Las Vega, NV
- 2009 NCCAM, NCCAM 10th Anniversary Symposium, Acupuncture, Pain and Placebo
- 2011 Keynote Speaker, "fMRI at 20—has it changed the World?" Lauterbur Lecture, International Society for Magnetic Resonance in Medicine, Montreal, Canada
- 2011 Henry N. Wagner, Jr., MD. Lecture, "PET and MRI: A Match Made in Heaven, or the Odd Couple?" Society for Nuclear Medicine meeting, San Antonio, TX
- 2012 Speaker, "7T Imaging", American Society of Functional Neroradiology, Orlando, Florida
- 2012 Speaker, "Neuroimaging Studies of the Future", American Society For Neuroradiology, 50th Annual Meeting, New York, NY
- 2013 Speaker, "The Long View-Scientific Opportunities in Neuroradiology Research", American Society For Neuroradiology Annual Meeting, San Diego
- 2013 Speaker, "PET/MR, Meet The Experts Session, International Society of Magnetic Resonance in Medicine, Salt Lake City
- 2013 Speaker, Grand Rounds, "Making Sense of the Connectome: New Tools and Approaches", University of Pennsylvania
- 2013 Speaker, Meet the Experts, "PET/MR", International Society for Magnetic Resonance in Medicine, Salt Lake City, UT
- 2013 Speaker, "fMRI – Has it Changed the Work?", Information Processing in Medical Imaging Conference, Asilomar, CA
- 2013 Plenary Speaker, "Pushing the boundaries of translational research", World Molecular Imaging Congress, Savannah, GA
- 2014 Speaker, Redington Lecture, "Multimodal Imaging of Brain Structure and Function", Duke University Medical Center, Durham, NC
- 2014 Speaker, Grand Rounds, "Advances in Imaging in The Human Connectome", Yale University, CT
- 2014 Speaker, Maroney-Bryan Lecture, "Functional Molecular Imaging with MR-PET, UC Davis, CA
- 2014 Speaker, American Academy of Neurology Annual Meeting, "Advances in Mapping Human Brain Connectivity-The Human Connectome Project", Philadelphia, PA

- 2014 Speaker, Stanford University, “Stanford Neurosciences Institute Inaugural Symposium”, Stanford, CA
- 2015 Speaker, Grand Rounds, “Advances in functional neuroimaging”, Johns Hopkins Hospital, Baltimore, MD
- 2015 Speaker, NYU School of Medicine, Norman E. Chase Lecturer, “Functional Imaging: Where Are We Heading?”, New York, NY
- 2016 Keynote Speaker, Lautebur Lecture, “Challenges and Opportunities for Advanced Neuroimaging”, University Hospitals, Cleveland, OH
- 2016 Speaker, Resident Lecture, “Lessons Learned”, University Hospitals, Cleveland, OH
- 2017 Keynote Speaker, SPIE Medical Imaging, Orlando, FL
- 2017 Speaker, Grand Rounds, “Approaches to pushing the limits of Human Neuroimaging”, NIH/NINDS Clinical Neuroscience Grand Rounds, Bethesda, MD
- 2017 Speaker, PET/MRI Workshop, “Looking Forward to the Future of PET/MRI”, Chicago, IL
- 2018 Speaker, Imaging 2020, Jackson Hole, WY
- 2018 Speaker, MGH Development Event, Palm Beach, FL
- 2019 Speaker, NIH, Human Connectome Project Investigators Meeting, Bethesda, MD
- 2019 Speaker, RSNA Annual Meeting, Chicago, IL
- 2020 Speaker, NIH, Addressing Neuroimaging Challenges Workshop, Bethesda, MD
- 2021 Speaker, NIDA, Intramural Research Program Seminar Series, Baltimore, MD
- 2021 Speaker, ASNR21, Briding New Horizons of Innovations & Practice Oakbrook, IL
- 2021 Speaker, ISMRM21, “Historical Perspectives, 30 Years of Functional MRI”
- 2022 Keynote Speaker, UNC Chapel Hill, “2022 Radiology Department Research Symposium”
- 2023 Speaker, Emory University, “Biomedical Engineering Seminar Series”

International

- 1992 Speaker, “Advanced Clinical MR Imaging”, Society of Magnetic Resonance in Medicine, Berlin, Germany
- 1993 Plenary Speaker, “Functional Imaging with Contrast”, American Society of North America, Vancouver, Canada
- 1995 Plenary Speaker, “Dynamic MR Spectroscopy”, Society of Magnetic Resonance in Medicine, Nice, France
- 1996 Speaker, International Symposium on Functional Magnetic Resonance Imaging and Spectroscopy, John P. Robarts Research Institute, London, Ontario, Canada
- 1999 Speaker, 2nd Annual Chinese-American Frontiers of Science Symposium, Beijing, China
- 2001 Speaker, Sociedade Paulista De Radiologica meeting, San Paulo, Brazil
- 2001 Co-Moderator “Animal Brain MRI: Ischemia and Infarction”, International Society of Magnetic Resonance in Medicine, Glasgow, Scotland
- 2001 Speaker, MRI and MRI Course, “fMRI Overview “ and “Language Development”, Cairns, Australia
- 2001 Chair, Physiology Session, Organization of Human Brain Map Meeting, Brighton, UK
- 2006 Chair and Speaker, Motivation for Multi-Modality Neuroimaging: Imaging Perspective, Multi-Modal Functional Neuroimaging, Cortona, Italy
- 2008 Speaker, “MRI at 7T: one step closer to clinical in vivo microscopy”, University College London Institute of Neurology
- 2008 Annual Historical Lecture, “A History fMRI”, University College London, Institute of Child Health
- 2011 Speaker, “PET MR and its Future”, 50th Anniversary Lecture University College London, Institute of Nuclear Medicine, London

- 2012 Speaker, Presidents Plenary Session, American College of Neuropsychopharmacology Meeting, Hollywood, Florida
- 2013 Speaker, “MR/PET in Neuroimaging, European Congress of Radiology, Vienna, Austria
- 2014 Keynote Speaker, “7T MRI in MS”, Danish MS Symposium, Vester Sogade, Copenhagen
- 2015 Plenary Lecturer, “4th PET/MR Workshop”, Tuebingen, Germany
- 2017 Speaker, World Neuroscience Innovation Forum, London, England
- 2017 Speaker, AD/PD Imaging Symposium, Vienna, Austria
- 2017 Speaker, Weizman Institute, Rehovot, Israel
- 2017 Keynote Speaker, International Forum of Neuroimaging, Shenzhen, China
- 2018 Keynote Speaker, Fuzhou Conference, Fuzhou, China
- 2018 Speaker, Shenzhen International Autism Spectrum Disorder Forum, Shenzhen China
- 2019 Keynote Speaker, Molecular Meeting, St. John’s, Newfoundland
- 2019 Speaker, Max Planck Sociey Meeting, Berlin, Germany
- 2020 Speaker, Harvard-Shenzhen International Forum on Autism, Shenzhen, China
- 2025 Speaker, Fireside Chat, ISMRM Diffusion Workshop, Kyoto, JAPAN

Report of Clinical Activities and Innovations

Current Licensure and Certification

- 1984 National Medical Board Certification
- 1987 Massachusetts Medical License
- 1987 American Board of Radiology Certification

Practice Activities

Clinical Innovations

Report of Technological and Other Scientific Innovations

- 2003 Inhibition of psychostimulant-induced and nicotine-induced craving, US patent 6,517,812
- 2006 Application and Modification of Histological Stains as Magnetic Resonance Imaging Contrast Agents. Patent pending
- 2006 A Genomic-Systems Biology Map for Addictive Behaviors, Psychiatric Illnesses, and Functional Brain Complex Trait Disease. Patent pending
- 2007 X-ray attenuation assessment using MRI in MR/PET. Patent pending
- 2007 **Rosen BR**, Rose-Motion Correction for MR/PET Using MRI Based Navigators. US patent 7,945,079. Issued 2011 May 17
- 2007 **Rosen BR**, Wald LL, Witzel T, Stimulus Induced Rotary Saturation with a Contrast Agent for Magnetic Resonance Functional Imaging. US patent application

60/989,704. Filed 2007 November 21. Patent pending.

- 2007 **Rosen BR**, Wald LL, Witzel T, Stimulus Induced Rotary Saturation for Magnetic Resonance Functional Imaging. US patent application 11/944,062. Filed 2007 November 21. Patent pending.
- 2007 **Rosen BR**, Wald LL, Witzel T, Stimulus Induced Rotary Saturation (SIRS) for Functional Neuroimaging. US patent application US2007/85403. Filed 2007 November 21.
- 2007 A Non-Invasive Method to Detect Gene Delivered into Brain Cells of Live Animals. Patent pending
- 2008 **Rosen BR**, Wald LL, Witzel T, Method for Magnetic Resonance Imaging Using Stimulus Induced Rotary Saturation With a Contrast Agent. US patent 8,849,372. Issued 2014 September 30.
- 2009 Adalsteinsson E, Bolar, D, **Rosen BR**, Sorensen AG, System and Method to Analyze Blood Parameters Using Magnetic Resonance Imaging. US patent 8,958,866. Issued 2015 February 17
- 2009 Bonmassar G, Hamalainen MS, **Rosen BR**, Deep Brain Stimulation Implant with Mircocoil Array. US patent 8,944,985. Issued 2015 February 3
- 2012 **Rosen BR**, Wald LL, Zhu B, Method For Magnetic Resonance Imaging Using Saturation Harmonic Induced Rotary Saturation. US patent 9,211,082. Issued 2015 December 15.
- 2013 Andronesi OC, Bhat H, Caravan P, **Rosen BR**, System for Optimized Low Power MR Imaging. US patent application 14/773,632. Filed 2013 August 5. Patent pending.
- 2015 Bjornerud A, Emblem KE, Jain RK, Mouridsen K, **Rosen BR**, Sorensen AG, System and Method for Vessel Architectural Imaging. US patent application 14/773,632. Filed 2015 September 8. Patent pending.
- 2015 Guerin B, **Rosen BR**, Wald LL, System and Method for Hyperthermia Treatment Using Radiofrequency Phased Arrays. US patent application 14/668,393. Filed 2015 March 25. Patent pending.
- 2015 Mandeville JB, **Rosen BR**, Sander CY, Neuro-Receptor Imaging Systems and Methods. US patent application 62/238,788. Filed 2015 October 8. Patent pending.

Report of Education of Patients and Service to the Community

Activities

Educational Material for Patients and the Lay Community

Books, monographs, articles and presentations in other media

Educational material or curricula developed for non-professional students

Patient educational material

Recognition

Report of Scholarship

Publications

Peer reviewed publications in print or other media

1. **Rosen BR**, Moran JM, Reid MJ, Walker RD, Burke BS, Johnson KJ, Spencer JH. Observations of OH and H₂O microwave maser emission for VY Canis Majoris. *Astrophys J*. 1978; 222:132-139.
2. Moran JM, **Rosen BR**. The estimation of propagation delay through the troposphere from microwave radiometer data. In: *Proceedings of the Conference on Radio Interferometry Techniques for Geodesy*. Coates RA, ed. NASA Conference Publications #2115, 1980.
3. Moran JM, **Rosen BR**. The estimation of propagation delay through the troposphere from microwave radiometer data. *Radio Science*. January 1981.
4. Brady TJ, **Rosen BR**, Pykett IL, McGuire MH, Mankin HJ, Rosenthal DI. NMR imaging of leg tumors. *Radiology*. 1983 Oct;149(1):181-187.
5. New PFJ, **Rosen BR**, Brady TJ, Buonanno FS, Kistler JP, Burt CT, Hinshaw WS, Newhouse JH, Pohost GM, Taveras JM. Potential hazards and artifacts of ferromagnetic and nonferromagnetic surgical and dental materials and devices in NMR imaging. *Radiology*. 1983 Apr;147(1):139-148.
6. Pykett IL, **Rosen BR**, Buonanno FS, Brady TJ. Measurement of spin-lattice relaxation times in nuclear magnetic resonance imaging. *Phys Med Biol*. 1983 Jun;28(6):723-729.
7. Pykett IL, **Rosen BR**. Nuclear magnetic resonance: In vivo proton chemical shift imaging. *Radiology*. 1983 Oct;149(1):197-201.
8. **Rosen BR**, Brady TJ. Principles of nuclear magnetic resonance for medical application. *Semin Nucl Med*. 1983 Oct;13(4):308-18.
9. DeLaPaz RJ, New PFJ, Taveras JM, Buonanno FS, Kistler JP, Oot RF, **Rosen BR**, Brady TJ. Proton NMR imaging of intracranial hemorrhage. *J Comput Assist Tomogr*. 1984 Apr;8(2):599-607.
10. DeWitt LD, Buonanno FS, Kistler JP, Zeffiro T, DeLaPaz RL, Brady TJ, **Rosen BR**, Pykett IL. Central pontine myelinolysis: demonstration by nuclear magnetic resonance. *Neurology*. 1984 May; 34(5):570-6.

11. Gonzalez RG, Cheng H-M, Barnett P, Aquayo P, Glaser B, **Rosen BR**, Burt CT, Brady TJ. Nuclear magnetic resonance imaging of the vitreous body. *Science*. 1984; 223:399-400.
12. **Rosen BR**, Pykett, IL, Brady TJ. Spin lattice relaxation time measurements in two-dimensional nuclear magnetic resonance imaging; corrections for plane selections and pulse sequence. *J Comput Assist Tomogr*. 1984 Apr;8(2):195-199.
13. **Rosen BR**, Wedeen VJ, Brady TJ. Selective saturation proton NMR imaging. *J Comput Assist Tomogr*. 1984; 8:813-818.
14. Edelman RR, McFarland E, Stark DD, Ferrucci JT Jr, Simeone JF, Wismer G, White EM, **Rosen BR**, Brady TJ. Surface coil MR imaging of abdominal viscera. Part I. Theory, technique, and initial results. *Radiology*. 1985 Nov; 157(2):425-430.
15. Grief WL, Buxton RB, Lauffer RB, Saini S, Stark DD, Wedeen VJ, **Rosen BR**, Brady TJ. Pulse sequence optimization for MR imaging using a paramagnetic hepatobiliary contrast agent. *Radiology*. 1985 Nov; 157(2):461-466.
16. Johnston DL, Brady TJ, Ratner AV, **Rosen BR**, Newell JB, Pohost GM, Okada RD. Assessment of myocardial ischemia with proton magnetic resonance: effects of a three hour coronary occlusion with and without reperfusion. *Circulation*. 1985 Mar;71(3):595-601.
17. McFarland E, Koutcher JA, **Rosen BR**, Teicher B, Brady TJ. In-vivo ¹⁹F NMR imaging. *J Comput Assist Tomogr*. 1985 Jan-Feb;9(1):8-15.
18. New PFJ, Bachow TB, Wismer GL, **Rosen BR**, Brady TJ. MR imaging of the acoustic nerves and small acoustic neuromas at 0.6T: prospective study. *AJR Am J Roentgenol*. 1985 May; 144(5):1021-66.
19. **Rosen BR**, Carter EA, Pykett IL, Buchbinder BR, Brady TJ. Proton chemical shift imaging: An evaluation of its clinical potential using an in-vivo fatty liver model. *Radiology*. 1985 Feb;154(2):469-472.
20. Wedeen VJ, **Rosen BR**, Chesler DA, Brady TJ. MR velocity imaging by phase display. *J Comput Assist Tomogr*. 1985 May-Jun; 9(3):530-6.
21. Wedeen VJ, Meuli RA, Edelman RR, Geller SC, Frank LR, Brady TJ, **Rosen BR**. Projective imaging of pulsatile flow with magnetic resonance. *Science*. 1985 Nov 22; 230(4728):946-8.
22. Wismer GL, **Rosen BR**, Buxton RB, Stark DD, Brady TJ. Chemical shift imaging of bone marrow: Preliminary experience. *AJR AM J Roentgenol*. 1985 Nov;145(5):1031-7.
23. Buxton RB, Wismer GL, Brady TJ, **Rosen BR**. Quantitative proton chemical shift imaging. *Magn Reson Med*. 1986 Dec; 3(6):881-990.
24. Dinsmore RE, Wedeen VJ, Miller SE, **Rosen BR**, Fifer M, Vlahakes GJ, Edelman RR, Brady TJ. MRI of dissection of the aorta: Recognition of the intimal tear and differential flow velocities. *AJR Am J Roentgenol*. 1986 Jun; 146(6):1286-8.
25. Edelman RR, Johnson K, Buxton RB, Shoukimas GM, **Rosen BR**, Davis KR, Brady TJ. MR of hemorrhage: A new approach. *AJNR Am J Roentgenol*. 1986 Sep-Oct; 7(5):751-6.
26. Johnston DJ, Thompson RC, Liu P, Dinsmore RE, Wismer GL, Saini S, Kaul S, **Rosen BR**, Brady TJ, Okada RD. Magnetic resonance imaging of patients with a recent myocardial infarction. *Am J Cardiol*. 1986 May 1; 57(13):1059-65.
27. Levine RA, Weyman AE, Dinsmore RE, Southern J, **Rosen BR**, Guyer DE, Brady TJ, Okada RD. Noninvasive tissue characterization: Diagnosis of lipomatous hypertrophy of the atrial septum by nuclear magnetic resonance imaging. *J Am Coll Cardiol*. 1986 Mar; 7(3):688-92.
28. McFarland EW, **Rosen BR**. NMR instrumentation and hardware available at present and in the future. *Cardiovasc Intervent Radiol*. 1986;8(5-6):238-50.
29. Meuli RA, Wedeen VJ, Geller SC, Edelman RR, Frank LR, Brady TJ, **Rosen BR**. MR gated subtraction angiography: evaluation of lower extremities. *Radiology*. 1986 May; 159(2):411-8.
30. New PFJ, Ojemann RG, Davis KR, **Rosen BR**, Heros R, Kjellberg RN, Adams RD, Richardson EP

- Jr. MR and CT of occult vascular malformations of the brain. *AJR Am J Roentgenol.* 1986 Nov; 147(5):985-93.
31. Oot RF, New PFJ, Spellman JP, **Rosen BR**, Shoukimas GM, Davis KR. The detection of intracranial calcifications by MR. *AJNR Am J Neuroradiol.* 1986 Sep-Oct; 7:801-9.
 32. Wedeen VJ, **Rosen BR**, Buxton RB, Brady TJ. Projective MRI angiography and quantitative flow-volume densitometry. *Magn Reson Med.* 1986 Apr; 3(2):226-41.
 33. Buxton RB, Edelman RR, **Rosen BR**, Wismer GL, Brady TJ. Contrast in rapid MR imaging: T1 and T2 weighted imaging. *J Comput Asst Tomogr.* 1987 Jan-Feb;11(1):7-16.
 34. Dinsmore RE, Wedeen VJ, **Rosen BR**, Wismer GL, Miller SW, Brady TJ. Phase-offset technique to distinguish slow blood flow and thrombus on MR images. *AJR Am J Roentgenol.* 1987; 148(3):634-6.
 35. Johnston DL, Liu P, Lauffer RB, Newell J, Wedeen V, **Rosen BR**, Brady TJ, Okada RD. Use of gadolinium-DPTA as a myocardial perfusion agent: Potential applications and limitations for magnetic resonance imaging. *J Nucl Med.* 1987 May; 28(5):871-7.
 36. Johnston DL, Liu P, **Rosen BR**, Levine PA, Beaulieu PA, Brady TJ, Okada RD. in vivo detection of reperfused myocardium by nuclear magnetic resonance imaging. *J Am Coll Cardiol.* 1987 Jan;9(1):127-35.
 37. **Rosen BR**, Fleming DS, Kushner DC, Zaner KS, Buxton RB, Bennet WP, Wismer GL, Brady TJ. Hematologic bone marrow disorders: quantitative chemical shift MR imaging. *Radiology.* 1988 Dec; 169(3):799-804.
 38. Villringer A, **Rosen BR**, Belliveau JW, Ackerman JL, Lauffer RB, Buxton RB, Chao Y-S, Wedeen VJ, Brady TJ. Dynamic imaging with lanthanide chelates in normal brain: Contrast due to magnetic susceptibility effects. *Magn Reson Med.* 1988 Feb; 6(2):164-74.
 39. Wismer GL, Buxton RB, **Rosen BR**, Fisel CR, Oot RF, Brady TJ, Davis KR. Susceptibility induced MR line broadening: Applications to brain iron mapping. *J Comput Asst Tomogr.* 1988 Mar-Apr; 12(2):259-65.
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Major Current Research Interests:

1. Functional magnetic resonance imaging
2. Quantification of physiological parameters with multimodal imaging approaches
3. Neuromolecular imaging

For the past thirty years, my research has focused on the development and utilization of physiological and functional NMR techniques. Most of my work is centered at the interface between technology

development and biological/clinical applications. Current research in NMR technique development includes measurement of the physiological and metabolic changes associated with brain activation and cerebrovascular insult, including methods to quantify oxygen metabolism, hemodynamic variables of CBF and CBV, metrics of brain connectivity, and direct imaging of neuronal currents with MRI and MEG. I am also working to apply the principles of magnetic susceptibility spin physics to measure characteristic scale lengths in biological media, including microvascular and intracellular morphology, to compliment hemodynamic measurements. I am pursuing the application of high-speed imaging tools to magnetic resonance imaging with molecular specificity (so-called "molecular imaging"), an offshoot of my longstanding interest in imaging proton metabolites via chemical shift imaging techniques. This involves the development of a new class of contrast agents with improved sensitivity, and specificity to molecular events such as mRNA expression. In addition to technical developments, my research addresses how functional imaging tools can be applied to solve specific biological and clinical problems. Several specific areas of interest are currently under study. Quantitative MRI studies of hemodynamic and metabolic parameters during cerebral ischemia and reperfusion are now being used to test the relationship between these physiological parameters and cell death following stroke., and the use of functional imaging methods, along with complimentary optical and MEG technologies, is addressing issues of the recovery process following stroke. To study tumor angiogenesis, we are using measurements of microvascular morphology and physiology to understand the mechanisms and efficacy of anti-angiogenic therapeutics. Finally, I am using fMRI tools to evaluate the linkage between neuronal and physiological (metabolic and hemodynamic) events during periods of increased and decreased neuronal activity. These studies, which include the temporal sequence of changes in CBF, CBV, and CMRO₂, should allow us to improve our ability to interpret fMRI signal changes, and develop new ways of probing brain function, including "event related" fMRI studies, and means to directly image neuronal currents using MRI.

Since 2000, I have led the activities of the Center for Functional Neuroimaging Technologies, a Regional Resource supported by the National Center for Research Resources (NCRR). The CFNT aims to develop innovative imaging technologies for acquisition and analysis of functional images within a highly integrated, multi-modality framework. The overarching goal of this multidisciplinary research program is to provide technological resources that support diverse programs of basic and clinical research to promote better understanding of the human brain in health and in disease. In addition to supporting four technology development projects which use a broad array of imaging technologies, including MRI, MEG, Optical imaging, EEG and now PET imaging, the CFNT supports collaborative research and service use of the very resources the Center is actively working to develop. These technologies are thus being actively used by myself and clinical colleagues in the study of Alzheimers Disease, Parkinsons Disease, brain tumors, multiple sclerosis, epilepsy, ALS, dystonia, and ALD within the realm of neurological disorders, and depression, drug addition, schizophrenia, ADHD, and autism as major psychiatric illnesses.

Another major research interest is in the area of neuroinformatics, serving as lead investigator of the Morphometry test bed within the Biomedical Informatics Research Network (BIRN), a multi-institutional community of shared resources that permits collaborative research, tools, and infrastructure for standardization, synchronization, and integration. The Morphometry BIRN, or mBIRN, which is seated at the Martinos Center and intimately related to the Center for Functional Neuroimaging Technologies, aims to develop the next generation of informatics tools to allow for the performance of multi-site and cross-platform clinical investigations to delineate the anatomical characteristics associated with conditions such as neurodegenerative and cognitive disorders, and further to provide a unifying informatics platform to facilitate sharing of primary neuroimaging data from sites throughout the world.

Finally, a major research initiative in recent years has been a growing program focused on investigating the neurobiology of acupuncture and other complementary medical practices. As Principal Investigator of a new Center of Excellence for Research in Complementary and Alternative Medicine I have assembled a group of neuroscientists, engineers, western medically trained clinicians with expertise

in psychiatric illness and pain management, and experienced CAM practitioners with basic science research interests to examine treatments such as acupuncture and meditation within the evidence-based framework of the scientific method, so as to develop a more rigorous understanding of how these ancient healing practices may produce their effects on the human body and brain.