

Other Professional Positions

04/26/2010- 04/30/2010	Visiting Professor	University of Bremen, Bremen, Germany
06/01/2010- 07/15/2010	Professeur Invité	Institut National Sciences Appliquees (INSA), Lyon, France
10/01/12 – 11/05/2012	Visiting Professor	Universite de Lyon (Claude Bernard, Lyon 1), Lyon, France
11/26/2012- 01/03/2013	Visiting Professor	Universite de Lyon (Claude Bernard, Lyon 1), Lyon, France
02/04/2013- 02/22/2013	Visiting Professor	Universite de Lyon (Claude Bernard, Lyon 1), Lyon, France
11/1/2014- 12/31/2014	Visiting Professor	University of Bordeaux, Initiatives d'Excellence (IdEx)
03/06/2015- 04/05/2015	Professeur Invité	Institut National Sciences Appliquees (INSA), Lyon, France
06/27/2015- 07/15/2015	Visiting Professor	University of Bordeaux, Initiatives d'Excellence (IdEx)
09/01/2015- 09/30/2015	Visiting Professor	Institut National Sciences Appliquees (INSA), Lyon, France

Major Administrative Leadership Positions

Local

2000-	Director, Center for Neurological Imaging	Brigham and Women's Hospital, Departments of Radiology and Neurology Brigham and Women's Hospital
2007	Organizer and Chair, First BWH BRI Neuroscience Research Center Mini-Symposium: Multiple Sclerosis (November 20, 2007)	
2010	Organizer and Co-Chair (with Dr. Robert Lenkinski), Harvard CATALYST scientific networking event (October 27, 2010)	Harvard Medical School

Regional

2010-	Internal Advisory Group Member	Delirium Program Project and SAGES Study (NIH-funded), PI: Dr. Sharon Inouye, Beth Israel Deaconess Medical Center, Boston
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National and International

2004	Organizer and Chair, ISMRM Workshop on "Aging Connections: Advanced MRI of Age-Related White Matter Changes in the Brain", Boston, MA	International Society for Magnetic Resonance in Medicine (ISMRM)
2006-2009	Board Member and Scientific Program Director, White Matter Diseases Study	International Society for Magnetic Resonance in Medicine (ISMRM)

2014-2015	Group Board Member (Secretary), White Matter Diseases Study Group	International Society for Magnetic Resonance in Medicine (ISMRM)
2015-2016	Board Member (Vice-Chair), White Matter Diseases Study Group	International Society for Magnetic Resonance in Medicine (ISMRM)

Committee Service

Local

1999-2000	Ad Hoc planning committee, 1.5T Magnetic Resonance Imaging facility, site renovation and imaging system installation	Brigham and Women's Hospital Departmental representative
2000	Ad Hoc planning committee, 3T Magnetic Resonance Imaging facility, site renovation and imaging system installation	Brigham and Women's Hospital Member
2001	MRI planning committee	Harvard Medical School, Harvard Center for Neurodegeneration and Repair (HCNR) Member
2005	LMRC MRI Operational Committee	Brigham and Women's Hospital, Department of Radiology Member
2007-2008	Ad-Hoc Planning Committee for Neuroscience Initiative for the Brigham Research Institute Building	Brigham and Women's Hospital Member
2007-2008	Brigham Research Institute Neurosciences Research Center Working Group	Brigham and Women's Hospital Member
2008	Planning Committee for Clinical Research Unit Facility of Partners MS Center at 1 Brookline Place, Brookline, MA	Brigham and Women's Hospital Member
2008	Translational Research Mini-Symposium Subcommittee (Brigham Research Institute Neurosciences Research Center)	Brigham and Women's Hospital Member
2011-present	Clinical Investigation Committee	Brigham and Women's Hospital, Center for Clinical Investigation Departmental Representative for Department of Radiology
2012-present	Multiple Sclerosis MRI Coordination Committee	Brigham and Women's Hospital, Depts. Of Radiology and Neurology Member
2015	MGH Think Tank on Neuroinflammation	Member

National and International

1998	Scientific Oversight Board	Centre de Recherche et d'Applications en Traitement de l'Image et du Signal, Unit _ CNRS (UMR 5515) Member
2003	Scientific Advisory Board	Huntington's Disease Drug Works Member
2005	Steering Committee	Pediatric MS Centers of Excellence Network, National Multiple Sclerosis

2006-2009	Pediatric MS Imaging Group	Society Member Pediatric MS Centers of Excellence Network, National Multiple Sclerosis Society Member
2006-2009	White Matter Diseases Study Group	International Society for Magnetic Resonance in Medicine Scientific Program Director
2008	International Scientific Advisory Board	Central and South-East European Consortium of Multiple Sclerosis Centers (CSEECMSC) Member
2009-2011	WMSG 2011 Workshop (“Advanced White Matter Imaging”), Reykjavik, Iceland Organizing Committee	International Society for Magnetic Resonance in Medicine, White Matter Study Group (WMSG) Member
2009- present	Multiple Sclerosis Research Program (DOD MSRP), Integration Panel (IP)	U.S. Department of Defense Member
2011- present	Observatoire Francais de la Sclerose en Plaques (OFSEP)	OFSEP, Lyon, France International Expert for Imaging
2014-2015	Board Member (Secretary), White Matter Diseases Study Group	International Society for Magnetic Resonance in Medicine (ISMRM)
2015-2016	Board Member (Vice-Chair), White Matter Diseases Study Group	International Society for Magnetic Resonance in Medicine (ISMRM)
2015-	Member	Guthy Jackson Charitable Foundation (GJCF) International Clinical Consortium & Biorepository

Professional Societies

1995-	International Society of Magnetic Resonance in Medicine, (formerly: Society of magnetic Resonance)	
1995-		Full Member
2006-2009		White Matter Diseases Study Group, Board Member and Scientific Program Director
2008		Annual Meeting, Scientific Session Moderator
2009		Annual Meeting, Scientific Session Moderator
2010		White Matter Study Group, Annual Meeting, Invited Panelist

Grant Review Activities

2004-2006		Federazione Italiana Sclerosi Multipla
2008		Association pour la Recherche sur la Sclérose en Plaques (ARSEP), France

2008		Canadian Multiple Sclerosis Society
2007-2008		National Multiple Sclerosis Society
2009		Austrian Science Fund
2009	NIH Challenge Grants in Health and Science Research (RC1) RFA-OD-09-003	NIH
2009	Neurotechnology (NT) Study Section/ Special Emphasis Panel/Scientific Review Group 2010/01 ZRG1 ETTN-B (50) S	NIH
2009	2009	Ad hoc Member
2009-present	Multiple Sclerosis Research Program (DOD MSRP), Integration Panel (IP)	U.S. Department of Defense Member
2011	Special emphasis panel (SEP; ZRG1 BDCN-Y-02)	NIH
2011	2011	Ad hoc Member
2011		Natural Sciences and Engineering Council of Canada (NSERC)
2011	Special Emphasis Panel/Scientific Review Group 2012/01 ZRG1 DTCS-U (81) S	NIH
2011	2011	Mail-in Reviewer
2011	Committee A	National Multiple Sclerosis Society
2012	2011	Ad hoc Member
		Translational Research and Advanced Imaging Laboratory (TRAIL), Université de Bordeaux, France (Ad-hoc Grant Review)
2014		Focused Ultrasound Surgery Foundation
2014		Translational Research and Advanced (Ad-hoc Grant Review)Imaging Laboratory (TRAIL), Université de Bordeaux, France (Ad-hoc Grant Review)
2015		Association pour la Recherche sur la Sclérose en Plaques (ARSEP), France

Editorial Activities

Ad hoc Reviewer

Neurology

IEEE Transactions on Medical Imaging

Journal of Magnetic Resonance Imaging

American Journal of Neuroradiology (AJNR)

Medical Physics

Journal of Rehabilitation Research and Development

Journal of Neurology, Neurosurgery & Psychiatry

Annals of Neurology

Neuroimage

Journal of the Neurological Sciences

Brain Research

Journal of the American Medical Association (JAMA)
Lancet Neurology
Neuroradiology
Human Brain Mapping (HBM)
Nature Reviews Neurology
NeuroImage: Clinical

Other Editorial Roles

1993-1997	Editorial Board Member	Cahiers d'anthropologie et Biométrie
2015-	Editorial Board Member	Journal of Neuroimaging

Report of Funded and Unfunded Projects

Funding Information

Past

- 1988-1989 *Postgraduate Course in Experimental Medicine and Biology*
University of Zürich, Kanton Zürich, Switzerland
Fellow
Multidisciplinary post-graduate course for young physicians aspiring to a career in research.
- 1990-1992 *Nachwuchsförderungsstipendium (Fellowship)*
Swiss National Science Foundation
Fellow
This Fellowship funded my Research Fellowship at Brigham and Women's Hospital.
- 1994-1996 *Roquinimex (Linomide) in the Treatment of Multiple Sclerosis (Phase II)*
Adria Laboratories (Pharmacia and Upjohn)
Co-Investigator
Phase II trial of Roquinimex (Linomide) in multiple sclerosis (MS).
- 1996-2000 *Optimized 3D Spin-echo MR Imaging of the Brain*
N.I.H./ University of Virginia, **R01 NS35142**
Co-Investigator
Development, implementation, and testing of single-slab 3D fast spin-echo sequences for brain imaging. Assessment on patients with multiple sclerosis.
- 1997-2002 *Age-Related Changes in Cognition in Health and Disease*
N.I.H./ Massachusetts General Hospital, **P01 AG04953**
Co-Investigator
Assessment of morphological changes using MRI and image segmentation in patients with cognitive impairment (including Alzheimer's Disease) compared to healthy control Subjects.
- 1998-2002 *Morphologic Correlates of Disability in Relapsing-Remitting Multiple Sclerosis*
Foundation for Neurologic Diseases
PI
To study the relationship between clinical findings and MRI-derived measures of brain parenchymal changes.
- 1998-2008 *Neuroimaging Analysis Center*
NIH, **P41 RR13218-01**
Co-Investigator

- 1999-2001 To develop and test image analysis tools for the volumetric assessment of brain structures.
Quantitative 3D image-aided anatomic change detection
NIH- SBIR (Alphatech)
Co-PI
- 2000-2003 *Adaptive Functional MRI*
NIH, **R01 NS37922**
Co-Investigator
- 2000-2003 *Optimized 3D Spin-echo MR Imaging of the Brain*
NIH/ University of Virginia, **R01 NS35142**
Site PI
A randomized double blind placebo-controlled trial to evaluate the efficacy and safety of galantamine in subjects with mild cognitive impairment (MCI) clinically at risk for development of clinically probable Alzheimer_s disease.
Janssen Research Foundation
Investigator
A randomized double blind placebo-controlled trial to evaluate the efficacy and safety of galantamine in subjects with mild cognitive impairment (MCI) clinically at risk for development of clinically probable Alzheimer_s disease.
- 2002-2005 *A Phase 1 Study to Assess the Safety of One Dose of G2077 (CTLA4-IgG4m) in Patients with Relapsing-Remitting Multiple Sclerosis*
NIH/ UCSF, **N01 AI15416**
Co-Investigator
A Phase 1 Study to Assess the Safety of One Dose of G2077 (CTLA4-IgG4m) in Patients with Relapsing-Remitting Multiple Sclerosis
- 2002-2007 *Age-Related Changes of Cognition in Health and Diseases: Image Analysis Core*
NIH/MGH, **PO1 AG04953**
Co-Investigator
To provide imaging, image management, and image analysis services for the study of brain imaging correlates of cognitive decline.
- 2003-2004 *Denver Autoimmunity Center of Excellence Rapamune Trial*
N.I.H./ University of Colorado, **U19 AI46374**
Co-Investigator
- 2003-2005 *White Matter Architecture of Cognitive Dysfunctions*
NIH, **R21 MH067054**
Co-Investigator
- 2004-2009 *HRCA/ Harvard Research Nursing Home*
NIH, **2PO1 AG004390**
Site PI
- 2004-2009 *Brain Changes and Risk Factors Causing Impaired Mobility*
NIH/ University of Connecticut Health Center, **1ROI AG022092**
Site PI
The goal was to assess associations between impaired gait and mobility and white matter changes in the brain, visualized by MRI, and measured with advanced image analysis instruments.
- 2004-2007 *Characterization of Cortical Lesions in MS*

- National Multiple Sclerosis Society, **RG 3574-A-1**
 PI
 The goal was to detect and characterize brain cortical lesions in multiple sclerosis patients, through the use of high-resolution images obtained with single-slab 3D Fast Spin-Echo sequences.
- 2004-2007 *Disruption of White Matter Circuits in Multiple Sclerosis*
 National Multiple Sclerosis Society, **RG 3478A2/2**
 Co-Investigator
- 2005-2010 *Longitudinal Structural Imaging Change in the Era of HAART*
 NIH, **R01 NS036524-05**
 Co-PI
- 2005-2008 *Spinal Cord Atrophy in Multiple Sclerosis*
 National Multiple Sclerosis Society, **RG 3705-A-1**
 Co-Investigator
- 2006-2011 *Pediatric MS Center of Excellence Award*
 National Multiple Sclerosis Society
 Co-Investigator
- 2006-2009 *Gray vs. White Matter Brain Atrophy in Multiple Sclerosis*
 National Multiple Sclerosis Society, **RG 3798-A-2**
 Co-Investigator
- 2007-2011 *Gray vs. White Matter Brain Atrophy in Multiple Sclerosis*
 NIH, **R01 NS055083-01A1**
 Co-Investigator
- 2007-2012 *Neuromarkers of age-related cognitive decline*
 NIH R01
 Co-Investigator
- 2008-2009 *Medulla Oblongata Volume: A New Surrogate Marker of Copaxone Efficacy in Multiple Sclerosis*
 TEVA Neuroscience
 PI
- 2010-2013 *The Collaborative Network for Clinical Research in Immune Tolerance: Protocol Chair support*
 ITN/NIH **N01 AI15416**
 Co-Investigator
 The goal of this project is to prepare for the study initiation. This funding supports Dr. Khoury as the PI and Protocol Chair for ITN035 study.
- 2010-2012 *Risk Factors for Progression in MS*
 NMSS **RR 2005-A-13**
 Co-Investigator
 The goal of this prospective pilot study involving four major academic MS centers is to determine factors associated with different rates of progression in MS, and the degree to

which therapies affect it. We will test hypotheses to determine which factors (eg, MRI, blood biomarkers) or combination of factors link to disease progression using data from 1500 patients obtained during the two year prospective data collection period and obtained on the cohort in the 5 years prior to this two year period.

- 2010-2012 *Biomarkers and Risk Factors for Disease Progression in Multiple Sclerosis*
NMSS **RG 4256A4-2**
Co-Investigator
The overarching goal of this proposal is to identify biomarkers and risk factors for progression in multiple sclerosis and to incorporate these factors into statistical models that can accurately predict an individual patient's disease course with respect to progressive disability.
- 2011-2014 *Magnetic Resonance Disease Severity Scale for Multiple Sclerosis*
NMSS **RG 4354-A-2**
Co-Investigator
The objective of this project is to develop a composite MRI scale to evaluate involvement of the brain and spinal cord in patients with MS. The scale will combine conventional and advance MRI measures of lesions and atrophy and test the predictive value towards clinical impairment in a longitudinal study.
- 2013-2015 *Interdisciplinary Study of Delirium and it's Long Term Outcomes, Project 3*
Hebrew Rehabilitation Ctr/NIH **5 P01AG031720-04**
Site PI (Total Direct Costs over Funding Period: \$55,519)
Project 3 team from BWH will perform volumetric analysis of up to 240 MRI scans, yielding in particular the volume of cerebral white matter hyperintensities. The team will also contribute to data interpretation and manuscript preparation.
- Current**
- 2011-2016 *Intensive Blood Reduction to Lessen Functional Decline*
NIH/University of CT Health Center **R01AG022092**
Site PI (Total Direct Costs over Funding Period: \$532,770)
This is a Core, which will provide measurements of abnormal brain damage (white matter lesions) from magnetic resonance images (MRI) obtained from up to 600 MRI's in 200 subjects. Furthermore, we will provide scientific neuroimaging expertise to support and extend the goals of the Project.
- 2015-2017 *Clinical Trial Evaluating the Impact of Sleep and Sleep Deprivation on the Cerebral Glymphatic System*
Office of Naval Research **ONRBAAA15-001**
Investigator
This study has the potential to shed light on the pathophysiological mechanisms underpinning cognitive deficits associated with acute and chronic sleep loss, situations often unavoidable in the military. A better understanding of the basic functions of sleep and the mechanisms by which lack of sleep impairs waking cognitive performance would allow future development of countermeasures for situations in which operational demands limit the opportunity to sleep.
- 2015-2018 *Neurogenic Determinants of Fatigue in MS*
National Multiple Sclerosis Society **RG-1501-03141 (Pending; awarded)**
Principal Investigator
This project aims to study the relationship between fatigue in MS patients and damage to a particular circuit in the brain called the frontostriatal pathway, which links the frontal part of the brain to deeper structures of the brain, namely the caudate and putamen.

Report of Local Teaching and Training

Teaching of Students in Courses

2001	Introduction to Neuroscience First year Medical Students	Harvard Medical School 1 hour/year for 1 year + 4 hours preparation time
2011	Radiology (Lecture title: “Quantitative MRI morphometry for studying neurological diseases”) Third/Fourth Year Medical Students	Harvard Medical School 1 hour/year for 1 year + 2 hours preparation time

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

2002	Scholars in Clinical Science Program	Harvard Medical School 4 hour/year for 1 year + 3 hours preparation time
2003	Scholars in Clinical Science Program	Harvard Medical School 4 hour/year for 1 year + 3 hours preparation time

Laboratory and Other Research Supervisory and Training Responsibilities

1994-present	Supervision of Research Interns (undergraduate and medical students)/Center for Neurological Imaging	Daily mentorship on average ca. 1 month/yr
1996-present	Supervision of graduate students (Masters and Doctoral Candidates)	Research supervision and mentorship on average ca. 2 hours/week
1998-present	Supervision of Post-Doctoral Research Fellows	Research supervision and mentorship on average ca. 1 day/week

Formally Supervised Trainees

1994	Marina Perdiki, MD/ Clinical Pathologist in Athens, Greece Summer Student (University of Uppsala (Sweden))	
1994	Agneta Pantzar, MD Summer Student (medical Student at University of Uppsala (Sweden))	
1996	Matthieu Ferrant, PhD Co-supervised part of his work; co-authored one peer-reviewed conference paper	
1996	Michael Sullivan, MD Completed Harvard Senior Thesis under my supervision	
1996-2000	Seung-Schik Yoo, PhD/ Associate Professor of Radiology, Harvard, Boston, MA Co-supervised part of his work; 8 co-authorships (6 as first author)	
1996	Anna Berlin Summer Intern (medical Student at University of Uppsala (Sweden))	
1996	Allina Dimopoulou Summer Intern (medical Student at University of Uppsala (Sweden))	
1997	Matthieu Chabanas, PhD/ Professor, France Summer student during 3 months; developed first semi-functional mock-up and documentation of multiple sclerosis image database for undergraduate thesis (Joseph	

Fourier University, Grenoble, France)

1997-1998 Sumi Bao, PhD
 Doctoral Student in my laboratory; co-authored two journal articles (one as first author)

1997-1998 Gregory Cavanagh, MS/ IT Specialist, Harvard Medical School, Boston
 Completed Masters thesis under my guidance and supervision

1997-1998 Scott Campea
 Completed Harvard Senior Thesis under my supervision

1998 Christopher Nunes
 Co-supervised Masters Thesis (Tufts University)

1998-1999 Ted Zlatanov
 Supervised Masters Thesis

1998-1999 Patrick McCormick
 Co-supervised Masters Thesis (MIT)

1998-2000 Chahin Pachai, PhD/ Director of Imaging CRO
 Completed PhD thesis under my supervision.

1998-2002 Xing-Chang Wei, MB, MSc, FRCPC/ Medical Director, Diagnostic Imaging
 Alberta Children's Hospital; Clinical Associate Professor of Radiology
 Cumming School of Medicine, University of Calgary, Canada
 Post-Doctoral Research Fellow under my supervision; co-authored 8 peer-reviewed articles with me (3 as first author)

1999 Ho Yuan Der (Jim Hoyd)
 Undergraduate Internship (Boston University); final report

1999 Carinne Rumolo
 Supervised undergraduate thesis (Joseph Fourier University, Grenoble, France)

1999 Francois Cotton, MD, PhD/ Professor of Anatomy and Radiology, University of Lyon, Lyon, France
 Completed post-doctoral research Fellowship under my supervision and published 1 first-author article.

1999 Valentine Sulaksono
 Undergraduate Internship (Boston University); final report

1999 Brian J. Young
 Undergraduate Internship (Boston University); final report

1999 Maria Valeria Cherchi, MD
 Post-Doctoral Research Fellow under my supervision

1999-2002 Alexander Guimond, PhD
 Research Fellow, published multiple full-length Conference proceedings and 1 Journal article

1999-2002 Ying Wu, MD/ Assistant Professor, Chicago
 Post-doctoral Research Fellow in my laboratory: published 1 first-author peer-reviewed journal article

2000-2001 Xiaoming Li, MD
 Post-doctoral Research Fellow in my laboratory; co-authored one peer-reviewed journal article

2000-2002 Jonathan Wisco, PhD/ Assistant Professor

Completed Boston University PhD thesis under my supervision and published 2 articles as first author

2001-present Dominik Meier, PhD, Assistant Professor of Radiology, Harvard, Boston, MA
Research Fellow, now Staff in my lab; published numerous high quality articles

2001 Daniel Goldberg-Zimring, PhD
Research Fellow, published 2 articles

2001 Gabor Borgulya, MD, PhD
Research Internship

2001-2002 Julien Milles, PhD/ Assistant Professor at University of Leiden, The Netherlands
Completed French (INSA) PhD thesis under my co-supervision; 2 articles

2001-2003 Nankuei Chen, PhD/ Assistant Professor
Research Fellow in my lab; coauthored 3 journal articles (2 as first author)

2001-2008 Svetlana Egorova, MD/ Instructor in Neurology, Harvard
Research Fellow in my lab

2002 Zoltan P Nagy, MD/ Clinical Radiologist in UK
Post-Doctoral Research Fellow; co-authored one peer-reviewed journal article.

2002-2003 I Leng Tan
Doctoral student (Amsterdam, the Netherlands)

2002-2004 Dorota Kozinska, PhD/ Deceased
Research Fellow in my lab, published 1 first author article in Neuroimage

2002-2004 Zsuzsanna Liptak, MD/ Clinical Radiologist in Sweden
Research Fellow in my lab, published 1 first author article in AJNR and co-authored several other articles

2002-2008 Christopher Holland, MD, PhD/ Neurosurgery Resident, Emory University, GA
Completed Boston University PhD thesis under my supervision and published 3 articles.

2003-2004 Liu Lifeng, PhD
Research Fellow in my lab, published 1 first author article

2003-2008 Yang Duan, MD/ Radiologist in China
Post-doctoral Research Fellow: co-authored 1 article in AJNR as first author

2004-2005 Tarik Alkasab, MD
Research Internship under my supervision (Tufts University School of Medicine)

2004-2006 Kathryn Hoffman, PhD
Post-Doctoral Research Fellow under my supervision

2005 Issam Kably, MD
Post-Doctoral Research Fellow under my supervision

2005-present Nicola Moscufo, PhD/ Instructor in Radiology, Harvard
Research Fellow and Instructor in my laboratory; published 2 first author papers

2005 Julia Vass, MD/ Physician in Germany
Was summer intern in my lab and co-authored 1 article

2005-2009 Istvan Csapo, MS/ PhD Program Student, University of North Carolina, Chapel Hill
Worked as Research Assistant under my direct supervision and published 1 first-author article

2005-2010 Peter Hildenbrand, MD, Senior Neuroradiology Attending, Lahey Clinic, Burlington,

MA
 Visiting Research Fellow, co-authored multiple articles
 David F. Tate, Ph.D/ Assistant Professor, Health Science Center - San Antonio -
 2005-2011 University of Texas
 Visiting Research Fellow, then Assistant Professor and HIV-Encephalopathy Project
 Leader at CNI.

2006 Douglas Brylka, MD/ Resident, New York
 Co-authored 1 article

2006-2008 Annika Berger, MD/ Pediatric Resident in Germany
 Research Fellow in my lab; published 2 papers

2006-2009 Elisa Dell'Oglio, MS/ Database Specialist, Partners Healthcare, Boston
 Completed Italian Masters Thesis under my guidance and supervision.

2006-2007 Arnaud Charil, PhD
 Post-Doctoral Research Fellow under my supervision; co-authored 2 journal articles

2007 Christin Sander
 Summer Intern (3 months) under my supervision, first author of short conference
 paper (presented at the 2008 Annual International Society for Magnetic Resonance in
 Medicine Conference), as well as 2 other co-author conference abstracts.

2007-2009 Mehul Sampat, PhD/ Assistant Professor
 Research Fellow, co-authored 2 journal articles as first author

2008 Rydhwana Hossain
 Undergraduate summer student under my supervision (George Washington Summer
 Scholarship Program)

2008-2010 Andrea Mike, MD, PhD; Attending Neurologist at University of Pecs (Hungary)
 Research Fellow; McDonald Fellowship Awardee (Multiple Sclerosis International
 Federation); co-authored 2 articles as first author

2008-2010 Maria Liguori, MD/ Assistant Professor in Italy
 Research Fellow; published two first author articles in Genes and Immunity and
 JNNP

2009 Marco Battaglini, PhD
 Summer Fellow

2009 Michael Ginsburg
 Summer Student

2009-2011 Alexander Zaitsev, PhD
 Research Fellow, developed IT systems in my lab, including prototype of image
 analysis workflow system.

2009-2010 Federico Torelli, MD/ Physician in Rome, Italy
 Research Fellow, published 1 first-author article in Neuroimage

2011 Beata Reiber, Medical Student
 Completed the research training of fourth-year medical students for the
 Academic Medical Center of the University of Amsterdam under my supervision

2011 Stephanie Nijmaijer, Medical Student
 Completed the research training of fourth-year medical students for the
 Academic Medical Center of the University of Amsterdam under my supervision

2012- Michele Cavallari, MD, PhD
 Currently Research Fellow in my lab; was under my supervision as graduate student

for PhD thesis at Università la Sapienza, Rome, Italy (awarded February 4, 2014); was awarded Research Fellowship from Mallinckrodt Pharmaceuticals under my mentorship (2015)

- 2014- Fanny Munsch
PhD Student in Neuroscience at University of Bordeaux; co-supervision and thesis committee
- 2014-2015 Juan Carlos Prieto, PhD
Research Fellow (Computer Scientist) in my lab; was awarded Research Fellowship from Mallinckrodt Pharmaceuticals under my mentorship (2015)
- 2014 Roxana Ameli, MD
Research Trainee (French Masters candidate) in my laboratory; was awarded support under my co-mentorship from Societe de Radiologie Francaise (SFR)
- 2014 Venceslas Devillard
Co-supervision of Masters Thesis (INSA Lyon)
- 2014 Paul Mougel
Co-supervision of Masters Thesis (INSA Lyon)
- 2014- Miklos Palotai, MD
Research Fellow in my laboratory; was awarded McDonald Research Fellowship from Multiple Sclerosis International Federation under my mentorship (2015)
- 2015 Adrien Mallecourt
Co-supervision of Masters Thesis (INSA Lyon)
- 2015 Jessica Burggraaff, MD
Research Trainee (2 months)

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

No presentations below were sponsored by outside entities

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| 2010 | Pathophysiological and clinical insights from neuroimaging
CATALYST Neuroimaging Course (April 12, 2010) | Lecture
Massachusetts General Hospital, Boston, MA |
| 2011 | Imaging-based assessments of neurological diseases: multiple sclerosis
Harvard CATALYST Biomarkers CME Course | Lecture
Sheraton Commander Hotel, Cambridge, MA |
| 2014 | Patterns of cerebral damage: cause and consequence
CEDARTREE ('Center of Excellence for Delirium in Aging: Research, Training and Educational Enhancement') Delirium Bootcamp | Beth Israel Deaconess Medical Center, Boston, MA |

Local Invited Presentations

Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified

- 1994 Use of MRI in MS/ Seminar
Harvard Medical School, Boston
- 1995 Diagnosis and disease course: imaging aspects. The evolution of multiple sclerosis on MRI / Seminar

- National Multiple Sclerosis Society, Boston
- 2000 MRI-derived measurements for routine monitoring of brain lesion burden in multiple sclerosis/ Seminar
Massachusetts General Hospital, Boston
- 2000 Routine Quantitative Imaging for Neurological Disorders / Seminar
Brigham and Women's Hospital, Boston
- 2001 White Matter Disease and Impairment of Mobility / Seminar
Spaulding Rehabilitation Hospital, Boston, MA
- 2003 Neurological Disorders through the Eyes of Quantitative MRI / Seminar
Harvard Medical School, Boston
- 2003 A dynamic view of MS/ invited seminar
Partners MS Center, Brigham and Women's Hospital (Biogen)
- 2004 A dynamic view of MS
Partners MS Center, Brigham and Women's Hospital Boston
- 2005 Cause and Effect in Multiple Sclerosis: a Framework for Image-Centered Discovery / Seminar
Harvard School of Public Health (Betensky Lab)
- 2005 Cause and Effect in Neurological Diseases: a Framework for Image-Centered Discovery / Seminar
Massachusetts General Hospital, Boston
- 2010 Impairment of mobility in older persons with brain white matter disease/ Invited Seminar
Department of Neurology, Beth Israel Deaconess Medical Center
- 2010 The importance of imaging/ Lecture and scientific networking event (co-organized with Dr. Robert Lenkinski)
Harvard CATALYST
- 2010 Ibis redibis non morietur in bello: imaging and predicting the course of syndromes affecting central nervous system white matter
Partners MS Center, Brigham and Women's Hospital Boston
- 2011 Ibis redibis non morietur in bello: imaging and predicting the course of syndromes affecting central nervous system white matter
Martinos Center Brain Map Seminar, Massachusetts General Hospital, Boston, MA
- 2013 Structured Planning and Implementation of Neurological Explorations (SPINE): crowdsourcing to enhance research and education in clinical neuroscience Informatics Seminar, Partners eCare, Wellesley, MA
- 2014 Structured Planning and Implementation of Neurological Explorations (SPINE): a "virtual laboratory" to enhance research and education in clinical neuroscience. Seminar; Quantitative Tumor Imaging at Martinos Laboratory; Massachusetts General Hospital, Boston, MA
- 2015 A virtual laboratory for image-centered clinical translational research. Presentation, MGH Department of Psychiatry Quarterly Research Meeting, Massachusetts General Hospital, Boston, MA
- 2015 A virtual laboratory for image-centered clinical translational research. Presentation, Brigham and Women's Hospital (BWH) Radiology Research Symposium, "Clinical Translational Research", Longwood Inn Conference Center,

Boston, MA

Report of Regional, National and International Invited Teaching and Presentations

Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified

Regional

- 2000 Imaging for multiple sclerosis/ Seminar
Medical Imaging in Clinical Trials, Conference, (Drug Information Association),
Boston
- 2001 MRI as a Diagnostic and Prognostic Tool in MS, ADEM, Vasculitis,/ Invited Lecture
"CNS/Yale Neuroimmunology Symposium", Symposium, Connecticut Neurological
Society/Yale University School of Medicine

National

- 2002 An Integrated Relational Database for MS / Seminar
Nancy Davis Center Without Walls, Los Angeles, CA
- 2002 Understanding and Monitoring MS using Quantitative MRI / Seminar
Nancy Davis Center Without Walls, Los Angeles, CA
- 2003 A dynamic view of MS/ seminar
Sponsored Event (Biogen)
- 2004 MRI in MS: Beyond Flair and Enhancement/ Invited Lecture
2004 Multiple Sclerosis Update, Philadelphia, PA
- 2005 Methods of Brain Segmentation: Results in Patients with MS and on Older Subjects/
Invited Seminar
Department of Veterans Administration Medical Center, San Francisco, CA
- 2005 Image-centric Search for Causal Relationships in Multiple Sclerosis / Invited Lecture
The Jacobs Neurological Institute, Buffalo, NY
Cause and Effect in Neurological Diseases: A Framework for Image-Centered
- 2005 Discovery/ Invited Lecture
St. Luke Roosevelt Hospital; New York, NY
- 2005 Image Centered Characterization and Analysis of Neurological Syndromes/ Invited
Lecture
Brown University, Providence, RI
- 2005 MRI Assesment of Lesion Repair in MS / Seminar
Nancy Davis Center Without Walls, Los Angeles, CA
- 2005 Neuroimaging of the central myelin/Lecture, "Current Neurology 2005" CME Course
(Baylor College, Houston, TX)
- 2005 The role of non-conventional MRI in multiple sclerosis/Lecture, CME Program,
Boston, MA (University of Southern Florida (USF) College of Medicine)
- 2006 Role of New MRI Techniques in Monitoring Inflammation and Neurodegeneration in
MS / Seminar
Buffalo Neuroimaging Analysis Center (BNAC), The Jacobs Neurological Institute,
Buffalo, NY
- 2006 Role of new MRI techniques in monitoring inflammation and neurodegeneration in

- MS: implications for new trial designs and better understanding of MS Pathogenesis/Lecture, “Inflammation and Neurodegeneration in Multiple Sclerosis as Evidenced by Use of Magnetic Resonance Imaging: Implications for Current and Future Therapies” CME Course, New York, NY (Buffalo Neuroimaging Analysis Center (BNAC) Workshop)
- 2006 Neurodegenerative Syndromes Affecting Brain White Matter: an Image-centric Approach to Understanding Pathogenesis / Invited Lecture
Department of Neurology, University of New Mexico, Albuquerque, NM
- 2010 Ibis redibis non morietur in bello: imaging and predicting the course of syndromes affecting central nervous system white matter./ Invited Lecture
Hungarian Medical Association of America Annual Meeting, Sarasota, FL
- 2011 Genetic and environmental determinants of multiple sclerosis activity and progression: a role for neuroimaging?
Biomedical Research Imaging Center (BRIC), University of North Carolina, Chapel Hill, NC
- 2013 Image Data Bank
Workshop on Transplant and Cellular Therapy for Autoimmune Diseases, Milwaukee, WI
- 2013 Spatial and Temporal Assessment of Neurological Diseases: Why, What, and How
Department of Psychiatry, University of North Carolina, Chapel Hill, NC
- 2014 SPINE: a virtual laboratory for collaborative neuroimaging research./ Seminar
Department of Neurology (MS Clinic), Mount Sinai Hospital, New York, NY

International

- 1993 Sclérose en plaques. Aspect évolutif lésionnel en IRM 3D/ Seminar
Department of Neurology, Faculty of Medicine, C.H.U. Timone, University of Aix-Marseille, Marseille, France
- 1993 Sclérose en plaques. Aspect évolutif lésionnel en IRM 3D/ Seminar
Department of Neuroradiology , Centre Hospitalier National d' Ophtalmologie des Quinze-Vingts, Paris, France
- 1995 Analyse par I.R.M. de la distribution spatiale et temporelle des lésions dans la sclérose en plaques./ Seminar
Faculty of Medicine, University of Aix-Marseille, Marseille, France
- 1995 Highly reproducible MS lesion burden quantitation. Evaluation of MS Lesion Load: Comparison of Multiple Image Processing Techniques/ Seminar
Montreal Neurological Institute, Montreal, Canada
- 1998 Segmentation and Registration of Brain MRI/ Seminar
Institut National Recherches Informatiques et de l'Automatisme (INRIA), Sophia-Antipolis, France
- 1998 Epilepsy: a Multifaceted Challenge for MRI/ Seminar
Faculty of Medicine, University of Aix-Marseille, Marseille, France
- 1998 SEP: Suivi Evolutif par IRM/ Seminar
Centre de Recherches et d'Applications en Traitement de l'Image et du Signal, Institut National des Sciences Appliquées (CREATIS-INSA), Lyon, France

- 1999 Quantitative Monitoring of Brain Disease/ Seminar
Catholic University of Louvain, Louvain-la-Neuve, Belgium
- 2000 Image analysis and visualization for diagnosis, surgical planning, and therapy
guidance/ Invited Lecture
High Care, International Congress, Ruhr-University, Germany
- 2000 Global cooperation between Centres of Excellence/ Invited Lecture
World Congress of High-Tech Medicine, Conference, Hannover, Germany
- 2000 Template driven segmentation of the brain/ Invited Lecture
"International Workshop on the Measurement of Atrophy in MS", Workshop, Institute
of Neurology, University College London, London, UK
- 2000 Brain parenchymal changes: natural course and variability in health and disease/
Invited Lecture
"International Workshop on the Measurement of Atrophy in MS", Workshop, Institute
of Neurology, University College London, London, UK
- 2001 Quantitative automatisierte Analyse von MR-Bildern neurologischer Erkrankungen/
Invited Lecture
Lehren und Lernen mit neuen Medien in der Medizin, Medizinische Hochschule
Hannover, Hannover, Germany
- 2002 Harminc perc agy MRI és azután? From here to eternity/ Seminar
Institute of Diagnostic Imaging and Radiation Oncology, University of Kaposvár,
Kaposvár, Hungary
- 2002 30 Minutes of Brain MRI and then? From Here to Eternity/ Invited Seminar
Seminar in Neuroimaging, Free University of Amsterdam Medical Center, Amsterdam,
The Netherlands
- 2002 Studying Leucoaraiosis with 30 Minutes of Brain MRI. From Here to Eternity/
Seminar
Foothills Medical Center, Department of Clinical Neurosciences, The University of
Calgary, Calgary, Canada
- 2002 Looking at MS through the Eyes of Quantitative MRI: Pathogenesis, Structural
Damage and Functional Deficits/ Grand Rounds
Foothills Medical Center, Department of Clinical Neurosciences, The University of
Calgary, Calgary, Canada
- 2003 Quantitative MRI in MS/ Plenary Presentation
University of Kaposvár, Kaposvár, Hungary
- 2004 MRI Estimates of Volumetric Age-Related Changes in White Matter and Gray Matter/
Session Presentation
The International Society for Magnetic Resonance in Medicine, Annual Meeting
- 2004 Phenotypic and Functional Characterization of Multiple Sclerosis using MRI/ Invited
Lecture
Sylvia Lawry Centre for MS Research, Munich, Germany
- 2005 Cause and Effect in Neurological Diseases: a Framework for Image Centered
Discovery/ Invited Lecture
International School on Magnetic Resonance and Brain Function, Erice, Italy
- 2005 Cause and Effect in Neurological Syndromes: a Framework for Image centered

Discovery, *[Plenary Presentation]*

The Institute of Diagnostic Imaging and Radiation Oncology, University of Kaposvár, Kaposvár, Hungary

- 2006 Investigating multiple sclerosis: an example of image-centered explorations of neurological syndromes/ Invited Lecture
International School on Magnetic Resonance and Brain Function, Erice, Italy
- 2006 Investigating Multiple Sclerosis: an example of image-centered explorations of neurological syndromes/ Invited Lecture
Istituto Di Scienze Neurologiche, Consiglio Nazionale Delle Ricerche, Cosenza, Italy
- 2006 MRI-centered studies of neurological syndromes affecting brain white matter/ Invited Lecture
Department of Neurosciences, Imaging and Clinical Sciences, University of Chieti, Chieti, Italy
- 2008 Clinical Neuroscience research on Large Datasets: New Challenges, New Opportunities/ Invited Lecture
Department of Neurology, Universität Basel, Switzerland
- 2008 MRI, Image Analysis, and Informatics: Paths to Discovery in Diseases Affecting CNS White Matter
International School on Magnetic Resonance and Brain Function, Erice, Italy
- 2008 MRI, Image Analysis, and Informatics: Paths to Discovery in Diseases Affecting CNS White Matter/ Invited Lecture
Department of Radiology, University of Aberdeen, Aberdeen, Scotland (UK)
- 2008 MRI, Image Analysis, and Informatics: Strategies for Discovery in Diseases Affecting CNS White Matter/ Invited Lecture
Vrije Universiteit Medisch Centrum, Amsterdam, The Netherlands
- 2009 Modeling of Central Nervous System Diseases using Neuroimaging/ Invited Lecture
International School on Magnetic Resonance and Brain Function, Erice, Italy
- 2009 Modeling of central nervous system diseases using neuroimaging/ Invited Lecture
Fraunhofer MeVis Institut, Bremen, Germany
- 2010 Divining the Course of Neurological Diseases with Quantitative MR./ Invited Lecture
International School on Magnetic Resonance and Brain Function, Erice, Italy
- 2010 Structured Planning and Implementation of Neurological Explorations (SPINE)/ Seminar
Fraunhofer MeVis Institut, Bremen, Germany
- 2011 Ibis redibis non morietur in bello: imaging and predicting the course of multiple sclerosis./ Invited Lecture
International School on Magnetic Resonance and Brain Function, Erice, Italy
- 2012 MRI. Its status as Surrogate for Long Term clinical Development in Multiple Sclerosis
Charcot Foundation Symposium, Marbella, Spain
- 2012 Spatial patterns of white matter damage in the elderly: cause and consequence
BIS12 Symposium, Rome, Italy
- 2012 Understanding Spatial and Temporal Patterns of Brain Diseases: a role for computer science and informatics
Institut National Sciences Appliquees (INSA), Lyon, France
- 2013 Aging Cerebellar Connections: Lessons for MS
Journées IRM/ARSEP, Paris, France

- 2013 Novel Imaging Approaches
Multiple Sclerosis Symposium III, Beirut, Lebanon
Spatio-temporal assessment of lesions in MS using quantitative MRI
- 2013 Professor Zsolt Illes Inauguration Symposium, Faculty of Health Sciences, University of Southern Denmark, Odense, Denmark
- 2013 Structured Planning and Implementation of Neurological Explorations (SPINE): crowdsourcing to enhance research and education in clinical neuroscience./Seminar
Department of Neurology, Ospedale Civico/Cantonale di Lugano, Lugano, Switzerland
- 2014 Structured Planning and Implementation of Neurological Explorations (SPINE): crowdsourcing to enhance research and education in clinical neuroscience./ Invited Talk
European Magnetic Resonance in MS (MAGNIMS) Network Meeting, Graz, Austria
- 2014 Is the Thalamus involved in Cerebral Blood Flow Regulation?/ Invited Lecture
International School on Magnetic Resonance and Brain Function, Erice, Italy
- 2014 Leveraging Synergies Between Science and Education: The SPINE Virtual Laboratory and Citizen Science Platform for Image-Driven Neuroscience./Invited Lecture (and Platform Moderator)
1st Human Brain Project Educational Workshop, Tel Aviv University, Tel Aviv, Israel
- 2014 Leveraging synergies between science and education: the SPINE virtual laboratory and citizen science platform for image-driven neuroscience./ Keynote Lecture
Mediri Symposium 2014: Visions for Imaging – From Research to Application; Heidelberg, Germany
- 2014 SPINE: a virtual laboratory for collaborative neuroimaging research./ Invited Lecture
Max Planck Institut fuer Kognitions- und Neurowissenschaften, Leipzig, Germany
- 2015 Exploring the brain, its structures, and diseases using neuroimaging./Student Lecture for Course “Option Transversale: Imagerie du Vivant (OT-IMAVI)”, Institut National des Sciences Appliquées (INSA), Lyon, France
- 2015 Cerebral perfusion as modulator of damage and repair in neurological diseases./ Invited Lecture (and Round Table Moderator) Mini Symposium: “MRI in Clinical Neuroimmunology”; University of Southern Denmark, Odense, Denmark
- 2015 Benefits of quantitative MRI in MS./ Lecture in Workshop “Quantitative MRI Techniques And Their Applications To Spinal Cord Injury”; 4th International Spinal Cord Society (ISCoS) and American Spinal Injury Association (ASIA) Joint Scientific Meeting, Montreal, Canada
- 2015 Structured Planning and Implementation of Neurological Explorations (SPINE): crowdsourcing to enhance research and education in clinical neuroscience/ Invited Seminar Lecture
Universidad de los Andes, Grupo Imagine, Bogota, Colombia
- 2015 SPINE: a new gateway for open and collaborative image-centered science/ Plenary Lecture in Scientific Event for the 25-year Jubilee Celebration of the Kaposvar University Institute of Diagnostic Imaging and Radiation Oncology, Kaposvar, Hungary

Report of Technological and Other Scientific Innovations

Versatile Stereotactic Device	Koichi Oshio, Laurence P. Panych, Charles R.G. Guttmann; US Patent 6,080,164. 2000 Jun 27. Co-invented system to prospectively align head MRI images and data
Versatile Stereotactic Device and Methods of Use	Koichi Oshio, Laurence P. Panych, Charles R.G. Guttmann; Brigham and Women's Hospital. US patent 6,684,098 B2. 2004 Jan 27. Co-invented system to prospectively align head MRI images and data
Overlay of tinted images for visualizing change in	Meier, Dominik; Guttmann, Charles R.G. Brigham and Women's Hospital. US patent 10/966,588. 2008 Sep 16.

serial radiologic images.	Co-developed concepts for serial image analysis of evolving lesions
Database and image analysis workflow management system	Directed the development of a database application with integrated image analysis workflow management system (see also reference 51 (Liu L et al.) in “Research Investigations” subsection)

Report of Education of Patients and Service to the Community

Activities

1996	35th Annual Meeting of the French Association of Multiple Sclerosis Patients, Marseille, France/ Invited Speaker
	Lecture for patients (title: “Le Point sur IRM et SEP”)
2001	Boston Tudós Klub/ Invited Speaker
	Lecture to Hungarian community in Boston (Title: “Center for Neurological Imaging”)

Educational Material for Patients and the Lay Community

Those educational materials below sponsored by outside entities are so noted and the sponsor(s) is(are) identified.

Books, monographs, articles and presentations in other media

1.	"Now, more than ever. Progress in multiple sclerosis research". National Multiple Sclerosis Society (NMSS) ;1995.Video Production/ Contributor. (US National Multiple Sclerosis Society (NMSS))
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Recognition

2000-2001 Partners in Excellence Award, Partners Healthcare, Boston

Report of Scholarship

Peer reviewed publications in print or other media

Research Investigations

1.	Kikinis R, Shenton ME, Gerig G, Martin J, Anderson M, Metcalf D, Guttman CR , McCarley RW, Lorensen W, Cline H, et al. Routine quantitative analysis of brain and cerebrospinal fluid spaces with MR imaging. J Magn Reson Imaging. 1992 Nov-Dec;2(6):619-29. PMID:1446105
2.	el-Ouahabi A, Guttman CR , Hushek SG, Bleier AR, Dashner K, Dikkes P, Black PM, Jolesz FA. MRI guided interstitial laser therapy in a rat malignant glioma model. Lasers Surg Med. 1993;13(5):503-10. PMID:8264320
3.	Mulkern RV, Meng J, Oshio K, Guttman CR , Jaramillo D. Bone marrow characterization in the lumbar spine with inner volume spectroscopic CPMG imaging studies. J Magn Reson Imaging. 1994 Jul-Aug;4(4):585-9. PMID:7949685
4.	Khoury SJ, Guttman CR , Orav EJ, Hohol MJ, Ahn SS, Hsu L, Kikinis R, Mackin GA, Jolesz FA, Weiner HL. Longitudinal MRI in multiple sclerosis: correlation between disability and lesion burden. Neurology. 1994 Nov;44(11):2120-4. PMID:7969970

5.	Warfield S, Dengler J, Zaers J, Guttman CR , Wells WM 3rd, Ettinger GJ, Hiller J, Kikinis R. Automatic identification of gray matter structures from MRI to improve the segmentation of white matter lesions. <i>J Image Guid Surg.</i> 1995;1(6):326-38. PMID:9080353
6.	Mulkern RV, Meng J, Oshio K, Williamson DS, Lilly HS, Guttman CR , Jaramillo D. Spectroscopic imaging of the knee with line scan CPMG sequences. <i>J Comput Assist Tomogr.</i> 1995 Mar-Apr;19(2):247-55. PMID:7890851
7.	Kleine LJ, Mulkern RV, Guttman CR , Colucci VM, Jolesz FA. In vivo characterization of cytotoxic intracellular edema by multicomponent analysis of transverse magnetization decay curves. <i>Acad Radiol.</i> 1995 May;2(5):365-72. PMID:9419577
8.	Guttman CR , Ahn SS, Hsu L, Kikinis R, Jolesz FA. The evolution of multiple sclerosis lesions on serial MR. <i>AJNR Am J Neuroradiol.</i> 1995 Aug;16(7):1481-91. PMID:7484637
9.	Mulkern RV, Bowers JL, Heff A, Guttman CR , Sadowski RH. Triexponential decomposition of 1H spin-lattice relaxation decay curves of paramagnetically doped red cell suspensions at 7 T. <i>Phys Med Biol.</i> 1996 Feb;41(2):255-68. PMID:8746108
10.	Oshio K, Panych LP, Guttman CR . A simple noninvasive stereotactic device for routine MR head examinations. <i>J Comput Assist Tomogr.</i> 1996 Jul-Aug;20(4):588-91. PMID:8708061
11.	Bridges KR, Barabino GD, Brugnara C, Cho MR, Christoph GW, Dover G, Ewenstein BM, Golan DE, Guttman CR , Hofrichter J, Mulkern RV, Zhang B, Eaton WA. A multiparameter analysis of sickle erythrocytes in patients undergoing hydroxyurea therapy. <i>Blood.</i> 1996 Dec 15;88(12):4701-10. PMID:8977264
12.	Yoo SS, Guttman CR , Ives JR, Panych LP, Kikinis R, Schomer DL, Jolesz FA. 3D localization of surface 10-20 EEG electrodes on high resolution anatomical MR images. <i>Electroencephalogr Clin Neurophysiol.</i> 1997 Apr;102(4):335-9. PMID:9146495
13.	Hohol MJ, Guttman CR , Orav J, Mackin GA, Kikinis R, Khoury SJ, Jolesz FA, Weiner HL. Serial neuropsychological assessment and magnetic resonance imaging analysis in multiple sclerosis. <i>Arch Neurol.</i> 1997 Aug;54(8):1018-25. PMID:9267977
14.	Guttman CR , Jolesz FA, Kikinis R, Killiany RJ, Moss MB, Sandor T, Albert MS. White matter changes with normal aging. <i>Neurology.</i> 1998 Apr;50(4):972-8. PMID:9566381
15.	Schwartz RB, Hsu L, Kacher DF, Wong TZ, Alexander E 3rd, Okon S, Guttman CR , Black PM, Kelley RA, Moriarty T, Martin C, Isbister HG, Cahill CD, Spaulding SA, Jolesz FA. Intraoperative dynamic MRI: localization of sites of brain tumor recurrence after high-dose radiotherapy. <i>J Magn Reson Imaging.</i> 1998 Sep-Oct;8(5):1085-9. PMID:9786146
16.	Mulkern RV, Gudbjartsson H, Westin CF, Zengingonul HP, Gartner W, Guttman CR , Robertson RL, Kyriakos W, Schwartz R, Holtzman D, Jolesz FA, Maier SE. Multi-component apparent diffusion coefficients in human brain. <i>NMR Biomed.</i> 1999 Feb;12(1):51-62. PMID:10195330
17.	Guttman CR , Kikinis R, Anderson MC, Jakab M, Warfield SK, Killiany RJ, Weiner HL, Jolesz FA. Quantitative follow-up of patients with multiple sclerosis using MRI: reproducibility. <i>J Magn Reson Imaging.</i> 1999 Apr;9(4):509-18. PMID:10232508
18.	Kikinis R, Guttman CR , Metcalf D, Wells WM 3rd, Ettinger GJ, Weiner HL, Jolesz FA. Quantitative follow-up of patients with multiple sclerosis using MRI: technical aspects. <i>J Magn Reson Imaging.</i> 1999 Apr;9(4):519-30. PMID:10232509
19.	Yoo SS, Guttman CR , Panych LP. Functional magnetic resonance imaging using non-Fourier, spatially selective radiofrequency encoding. <i>Magn Reson Med.</i> 1999 Apr;41(4):759-66. PMID:10332852
20.	Kappos L, Moeri D, Radue EW, Schoetzau A, Schweikert K, Barkhof F, Miller D, Guttman CR , Weiner HL, Gasperini C, Filippi M. Predictive value of gadolinium-enhanced magnetic resonance imaging for relapse rate and changes in disability or impairment in multiple sclerosis: a meta-analysis.

	Gadolinium MRI Meta-analysis Group. Lancet. 1999 Mar 20;353(9157):964-9. PMID:10459905
21.	Khoury SJ, Orav EJ, Guttmann CR , Kikinis R, Jolesz FA, Weiner HL. Changes in serum levels of ICAM and TNF-R correlate with disease activity in multiple sclerosis. Neurology. 1999 Sep 11;53(4):758-64. PMID:10489037
22.	Bao S, Guttmann CR , Mugler JP 3rd, Brookeman JR, Panych LP, Kraft RA, Oshio K, Jaramillo D, Jolesz FA, Williamson DS, Mulkern RV. Spin-Echo planar spectroscopic imaging for fast lipid characterization in bone marrow. Magn Reson Imaging. 1999 Oct;17(8):1203-10. PMID:10499682
23.	Yoo SS, Guttmann CR , Zhao L, Panych LP. Real-time adaptive functional MRI. Neuroimage. 1999 Nov;10(5):596-606. PMID:10547337
24.	Weiner HL, Guttmann CR , Khoury SJ, Orav EJ, Hohol MJ, Kikinis R, Jolesz FA. Serial magnetic resonance imaging in multiple sclerosis: correlation with attacks, disability, and disease stage. J Neuroimmunol. 2000 May 1;104(2):164-73. PMID:10713356
25.	Guttmann CR , Benson R, Warfield SK, Wei X, Anderson MC, Hall CB, Abu-Hasaballah K, Mugler JP 3rd, Wolfson L. White matter abnormalities in mobility-impaired older persons. Neurology. 2000 Mar 28;54(6):1277-83. PMID:10746598
26.	Mulkern RV, Zengingonul HP, Robertson RL, Bogner P, Zou KH, Gudbjartsson H, Guttmann CR , Holtzman D, Kyriakos W, Jolesz FA, Maier SE. Multi-component apparent diffusion coefficients in human brain: relationship to spin-lattice relaxation. Magn Reson Med. 2000 Aug;44(2):292-300. PMID:10918329
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	orientation for fMRI in the presence of susceptibility field gradients: application to imaging of the amygdala. <i>Neuroimage</i> . 2003 Jul;19(3):817-25. PMID:12880810
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39.	Chen NK, Egorova S, Guttmann CR , Panych LP. Functional MRI with variable echo time acquisition. <i>Neuroimage</i> . 2003 Dec;20(4):2062-70. PMID:14683710
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41.	Meier DS, Weiner HL, Khoury SJ, Guttmann CR . Magnetic resonance imaging surrogates of multiple sclerosis pathology and their relationship to central nervous system atrophy. <i>J Neuroimaging</i> . 2004 Jul;14(3 Suppl):46S-53S. Review. PMID:15228759
42.	Goldberg-Zimring D, Achiron A, Warfield SK, Guttmann CR , Azhari H. Application of spherical harmonics derived space rotation invariant indices to the analysis of multiple sclerosis lesions' geometry by MRI. <i>Magn Reson Imaging</i> . 2004 Jul;22(6):815-25. PMID:15234450
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44.	Wei X, Guttmann CR , Warfield SK, Eliasziw M, Mitchell JR. Has your patient's multiple sclerosis lesion burden or brain atrophy actually changed? <i>Mult Scler</i> . 2004 Aug;10(4):402-6. PMID:15327037
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	and received B1 fields in magnetic resonance imaging. <i>IEEE Trans Biomed Eng.</i> 2006 May;53(5):885-95. PMID:16686411
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Letters to the Editor

1.	White WB, Wolfson L, Wakefield DB, Hall CB, Campbell P, Moscufo N, Schmidt J, Kaplan RF, Pearlson G, Guttmann CR . Response to Letters Regarding Article, “AverageDaily Blood Pressure, Not Office Blood Pressure, Is Associated With Progression of Cerebrovascular Disease and Cognitive Decline in Older People”. Circulation. 2012, in Press.
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Thesis

1.	Guttmann CRG . Die Bedeutung von Proteasen für das invasive Verhalten von Glioblastom Zelllinien im zentralen Nervensystem. Zurich, Switzerland: University of Zurich;1989.
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Narrative Report (limit to 500 words)

My overarching research interest is the in-vivo characterization and elucidation of neurological disorders using quantitative neuroimaging techniques, with primary focus on cerebral white matter abnormalities in normal aging and neurological diseases. White matter signal abnormalities on MRI are common correlates of cognitive and motor dysfunction, and reflect histologically heterogeneous parenchymal alterations, such as demyelination, astrocytosis, axonal loss, cellular infiltrates, edema, and micro-infarctions. Development of methods to estimate the extent of white matter abnormalities also serves the clinical purpose of monitoring the natural course of neurological diseases and treatment response.

I have recently started a collaborative NIH-sponsored clinical trial in older people to assess the impact of intensive anti-hypertensive intervention on the evolution of mobility impairment, as well as on the accrual rate of white matter changes on MRI. This is the culmination of years of pioneering research by us and others, which has established a link between brain white matter changes and gait impairment in the elderly, as well as a link to cardio-vascular risk factors, such as hypertension.

In a joint venture between the Departments of Radiology and Neurology I founded and direct the Center for Neurological Imaging (CNI) at Brigham and Women's Hospital. This serves several thousand multiple sclerosis (MS) patients at the Partners MS Center (Director: Dr. Howard L. Weiner). I am a co-investigator in multiple national and international research collaborations on imaging of neurologic disorders, including large-scale studies of MS in the quest for endogenous (e.g., genetic) and exogenous determinants of disease activity and progression. We have developed and deployed quantitative MRI-based strategies, such as time-series analysis (including powerful image subtraction techniques), and “context-based morphometry” (e.g., assessing spatial distribution of lesions in relation to brain perfusion patterns). Our recent work has identified genetic polymorphisms possibly linked to more rapid brain atrophy and more severe clinical deficits in MS, as well as seasonal patterns of disease activity on MRI. I intend to continue this line of imaging-based discovery research to explore interactions between endogenous and exogenous factors, which modulate disease activity in MS.

I direct development and evaluation of image acquisition and analysis strategies to quantitatively monitor morphological changes in the brain in clinical settings. This includes the development and deployment of image-centered relational databases and image analysis workflow management systems, enabling large-scale data collection and integration of clinical measures, biomarkers, as well as images and image-derived markers of disease.

My teaching activities are predominantly research focused. I actively supervise and mentor undergraduate, graduate, and post-graduate students, and lecture locally, nationally, and internationally on scientific and methodological topics. I also lead a project to build a web-based virtual laboratory with the goal of facilitating collaborative projects in neuroscience that have a neuroimaging component. This project is also designed to include an element of “citizen science” with the goal of involving and educating younger students and other “lay people” in neuroscience research.