THE FACULTY OF MEDICINE
Harvard University

Curriculum Vitae

Date Prepared:	January 26, 2025
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Education

06/2003	Laurea *summa cum laude*	Experimental Psychology (Profs. Cappa SF and Perani D)	Università Vita-Salute San Raffaele (Italy)
03/2008	PhD	Neurological Sciences (Prof. Bushnell MC)	McGill University (Canada)

Postdoctoral Training

08/2008 - 09/2012	Research Fellow	Anesthesia – Pain neuroimaging (Drs. Gollub, Wasan, Edwards)	Brigham and Women's Hospital, Harvard Medical School
09/2012 - 02/2013	Research Fellow	Radiology – Pain neuroimaging (Drs. Napadow, Wasan, Edwards)	Massachusetts General Hospital, Harvard Medical School

Faculty Academic Appointments

2013 – 2014	Instructor	Radiology	Harvard Medical School
2014 – 2019	Assistant Professor	Radiology	Harvard Medical School
2019 – present	Associate Professor	Radiology	Harvard Medical School
2023 – present	Associate Professor (secondary appointment)	Anaesthesia	Harvard Medical School
2024 – present	Faculty Affiliate	Program in Neuroscience	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

Past

2013 - 2015	Assistant	Radiology (Neuroscience)	Massachusetts General Hospital

Current

2013 - present	Faculty member	Athinoula A. Martinos Center for Biomedical Imaging	Massachusetts General Hospital
2016 - present	Research Staff	Radiology (Neuroscience)	Massachusetts General Hospital
2021 - present	Research Staff	Anesthesia, Critical Care and Pain Medicine	Massachusetts General Hospital

Faculty Membership in Harvard Initiatives, Programs, Centers, and Institutes

2013 - present	Faculty member	Athinoula A. Martinos Center for Biomedical Imaging	Harvard-MIT Health Science and Technology Program / MGH

Other Professional Positions

Past

2014 – 2017	Consultant (study on negative affect in chronic pain patients; PI: Wasan)	University of Pittsburgh
2018	Consultant (role of glial cells as therapeutic targets)	Shionogi INC
2018 – 2021	Consultant (Boston Biorepository, Recruitment, and Integrative Network; PI: Sullivan K)	Boston University

Current

2019 – 2025	Consultant (R01 to study spinal cord injury patients; PI: Linnman)	Spaulding Hospital

Major Administrative Leadership Positions

Local

2015 - 2021	Associate Director, Center for Integrative Pain NeuroImaging (CiPNI)	Massachusetts General Hospital
2021 - present	Co-Director, Center for Integrative Pain NeuroImaging (CiPNI)	Massachusetts General Hospital

2021 - 2024	Chair, PET Scientific Advisory Committee	Martinos Center, MGH

National

2021 - present	Member, Committee on Committees	US Association for the Study of Pain

International

2016	Chair, “First-in-human/clinical” category 2017 WMIS conference, New York, NY	World Molecular Imaging Society

Committee Service

Local

2015 - present	Neuroimaging Workgroup, The Football Players Health Study	Harvard University
2016 - 2021	“Neuroinflammation in Neurodegeneration” Strategic Alliance	MGH
2017	Research Fellow Poster Celebration Review Committee. Office for Research Career Development	MGH
2017 - 2019	Strategic Planning Committee, Martinos Center	MGH
2022 - present	Advisory Committee, the David Borsook Project	MGH
2022	Search Committee for the Executive Director, A. A. Martinos Center	MGH
2022 - 2023	Search Committee for the Chief of the Division of Pain Medicine, Department of Anesthesia, Critical Care and Pain Medicine	MGH

Regional

2022	Member, PhD Qualifying Exam Committee	Boston University

National

2017	Member, “Understanding the Neurobiological Mechanisms of Pain”	National Institutes of Health

	meeting (hosted by Dr. Francis Collins, NIH Director)	
2018 - present	Steering Committee	Boston Biorepository, Recruitment & Integrated Network (BBRAIN)
2019	Invited member as biomarker expert, Acute to Chronic Pain Signatures program	National Institutes of Health
2021	Presenter, National VA Research Advisory Committee on Gulf War Illness	Virtual
2021	Member, PhD Qualifying Exam Committee	University of Southern California (Virtual)

International

2024	External appraiser, PhD Exam Committee	University of Toronto

Professional Societies

2004 - present	The Society for Neuroscience	Member
2005 - present	The International Association for the Study of Pain	Member
2012 – 2020 (until society dissolution)	The American Pain Society	Member
2020 – present	US Association for the Study of Pain	Member

Grant Review Activities

2015	Grant Reviewing Committee 2015	PSI Foundation (Ontario, Canada) Ad hoc member
2015	Grant Reviewing Committee 2015	Italian Ministry of Health Ad hoc member
2015 - present	Doctoral and postdoctoral fellowships 2015 - 2017	Louise and Alan Edwards Foundation Ad hoc member
2016	Grant Reviewing Committee 2016	NIH Ad hoc member, ZAT1 SM (40)
2016	Grant Reviewing Committee 2016	Brain Canada Foundation Ad hoc member
2017	Grant Reviewing Committee	Auckland (NZ) Medical Research Foundation

	2017	Ad hoc member
2018	Grant Reviewing Committee 2018	Canada Foundation for Innovation Ad hoc member
2018	Grant Reviewing Committee 2018	NIH Ad hoc member, ZAT1 PJO2
2019	Grant Reviewing Committee 2019	NIH Ad hoc member, ZRG1 CFS-N (80)
2020	Grant Reviewing Committee 2020	NIH Ad hoc member, ZRG1 CFS-N (80)
2020	Grant Reviewing Committee 2020	NIH Ad hoc member, ZDA1 GXM-A (17) R
2021	Grant Reviewing Committee 2021	NIH Ad hoc member, ZRG1 F02B-E (20) L
2021	Grant Reviewing Committee 2021	NIH Ad hoc member, ZDA1SKP-D(18)S
2022-	Grant Reviewing Committee 2022	MGH Ad hoc member, MGH Neuroscience Transformative Scholar Program
2023	Grant Reviewing Committee 2023	NIH Ad hoc member, ZDA1 SKP-D M1 S, NIDA Centers Grant Program (P50) (P30)
2023	Grant Reviewing Committee 2023	NIH Ad hoc member, ZRG1 ICN-Z (55)
2023	Grant Reviewing Committee 2023	University of Iowa External Review Program
2024	Grant Reviewing Committee 2024	NIH Ad hoc member, 2024/05 ZNS1 SRB-C (01)

Editorial Activities

Ad hoc Reviewer

Experimental Brain Research

Clinical Journal of Pain

Cerebral Cortex

Pain

The Journal of Pain

European Journal of Pain

The Journal of Neuroscience Research
Annals of Neurology
Neuroscience Letters
Pain Medicine
The Journal of Neuroscience
Public Library of Science (PLoS) ONE
Arthritis & Rheumatology
Journal of Neurophysiology
Brain Connectivity
Human Brain Mapping
Current Biology
Neuroimage
Neuroscience & Biobehavioral Reviews
Neuroimage: Clinical
Pain Reports
Neuropsychologia
Neurology
Psychosomatic Medicine
eNeuro
Brain Imaging and Behavior
Neurobiology of Pain
Proceedings of the National Academy of Sciences
Molecular Psychiatry
European Journal of Nuclear Medicine and Molecular Imaging
Anesthesia & Analgesia
Brain Behavior & Immunity
Neuroscience
Neuroimage Reports
Nature Communications
JAMA Psychiatry
Nature

Other Editorial Roles

2014 – present	Editorial Board Member	Pain Medicine

2017 – present	Editorial Board Member	The Journal of Pain
2019 – 2023	Associate Editor	PAIN
2021 – 2022	Associate Editor	Frontiers in Pain Research
2022 – 2024	Specialty Chief Editor	Frontiers in Pain Research – Non Pharmacological Treatment of Pain
2023 – present	Section Editor	PAIN

Honors and Prizes

2004	Chancellor's Award	Università Vita-Salute San Raffaele	Academic Merit
2004	McGill Graduate Student Fellowship Award	McGill University	
2005 - 2007	McGill University Health Centre Studentship	McGill University	
2005 - 2007	CIHR Strategic Training Fellow in Pain	Canadian Institute of Health Research	
2007	Best Poster Presentation	Quebec Pain Research Network	
2007-2008	Travel Award	Quebec Pain Research Network	
2007	Returning student award	McGill University	
2008, 2010	Travel Award	International Association for the Study of Pain	
2011	Best Abstract (selected for Plenary Session oral presentation)	28th American Academy of Pain Medicine Annual Meeting	
2013	IASP Early Career Award	International Association for the Study of Pain	
2016	IASP Ulf Lindblom Young Investigator Award for Clinical Science	International Association for the Study of Pain	
2021	Council of Distinguished Investigators	Academy for Radiology & Biomedical Research	
2024	Invited Plenary Speaker	2024 World Congress on Pain	

2025	Invited Plenary Speaker	2025 Congress of the European Pain Federation

Report of Funded and Unfunded Projects

Funding Information

Past

2010 - 2015 *Biobehavioral risk factor for persistent pain following Total Knee Arthroplasty*
NCCAM/R01 AG034982
Investigator (PI: Edwards)
This project aims to study predictors of long-term outcomes in patients undergoing joint replacement. My contributions to the project include experimental design, data collection and analysis, results interpretation, manuscript writing.

2011 - 2016 *Neuroimaging Acupuncture Effects Brain Activity in Chronic Low Back Pain*
NCCAM/P01 AT006663
Investigator (PI: Rosen)
This program project grant will investigate the different neurophysiological mechanisms underlying the clinical response for different acupuncture interventions in chronic low back pain patients. My contributions to the project include experimental design, data collection and analysis.

2012 - 2013 *Assessing Activation of Brain Microglia in Chronic Pain with MR-PET*
Harvard Catalyst – Advanced Imaging Pilot Research Grant
Investigator (PI: Hooker)
This project will investigate microglial activation in the brain of patients with chronic low back pain, using integrated MR/PET technology. My contributions to the project include experimental design, data collection and analysis, results interpretation, manuscript writing.

2013 - 2014 *Autism Neuroinflammation Research Study*
Neuroimaging Autism
Investigator (PI: Hooker)
The aim of the study is to investigate in vivo whether individuals with autism show increased neuroinflammation, evidenced by increased microglial activation measured by [11C]PBR28 binding potential. My contributions to the project include experimental design.

2013 - 2014 *Arterial Spin Labeling as a Quantitative Measure of Pain Exacerbations in RA*
Rheumatology Research Foundation (Disease Targeted Research Pilot Grant)
Site PI ($8,160 – total direct cost) (PI: Lee)
The aim of this study is to evaluate the brain correlates of pain in patients suffering from rheumatoid arthritis, before and after treatment with DMARDs.

2013 - 2014 *An In-Vivo Investigation of Brain Inflammation in Fibromyalgia with Integrated PET/MR Imaging*
IASP Early Career Award
PI ($20,000 – total direct costs)

This project will investigate microglial activation in the brain of patients with fibromyalgia. My contributions to the project include experimental design, data collection and analysis, results interpretation, manuscript writing.

2013 - 2016 *PET/MRI Imaging of Neuroaxial Inflammation in Sciatica Patients*
NINDS/R21 NS082548-01A1
Investigator (PIs: Zhang/Hooker)
We propose to use PET/MRI with a novel inflammatory tracer to study the association between inflammation, structural changes, and symptoms in patients with sciatica pain. My contributions to the project include experimental design, data collection and analysis, results interpretation, manuscript writing.

2014 - 2015 *The Role of Neuroimmune Activation in Comorbid Anxiety and Chronic Pain*
ECOR internal funding
PI ($37,000 – total direct costs)
We propose experiments to test the hypothesis that the activation of brain microglia represents an important pathophysiological mechanism for chronic pain and anxiety in humans.

2014 - 2015 Institutional Service Agreement - Eli Lilly
Activation of spinal glia in chronic low back pain
Investigator (PI: Hooker)
In this project we will evaluate the hypothesis that glial activation in the spinal cord represents a pathophysiological mechanism associated with chronic low back pain.

2014 - 2016 *Neural correlates of spinal manipulative therapy*
NCMIC Foundation
PI ($55,000 – total direct costs)
The aim of this study is to assess brain responses to spinal manipulative therapy in chronic low back pain patients using Arterial Spin Labeling. My contributions to the project include experimental design, data collection and analysis, results interpretation, manuscript writing.

2014 - 2017 *The Role of Neuroimmune Activation in Comorbid Anxiety and Chronic Pain*
NINDS/R21 NS087472-01A1
PI ($275,000 – total direct costs)
We propose experiments to test the hypothesis that the activation of brain microglia represents an important pathophysiological mechanism for chronic pain and anxiety in humans.

2016 - 2017 *Imaging pain-related glial activation in retired professional football players*
Football Players Health Study at Harvard University
PI ($8,840 – total costs)
In this project, we will evaluate the presence of glial activation in retired NFL players, and its association with pain symptoms.

2014 - 2018 *An in-vivo investigation of brain inflammation in Gulf War Illness with integrated PET/MR*
DoD W81XWH-14-1-0543
PI ($600,000 – total direct costs)
The goal of this project is to demonstrate in vivo the pathological occurrence of microglial activation in the brain of GWI patients, and to document the effects of this

activation on GWI symptomatology and brain anatomophysiology, using novel imaging approaches.

2014 - 2019 *Brain mechanisms underlying CBT-related improvements in fibromyalgia*
NIH/NIAMS 5R01AR064367
Investigator (PIs: Edwards/Napadow)
We hypothesize that CBT in this study will reduce catastrophizing early in treatment, resulting in adaptive changes in the brain's responses to an externally applied noxious stimulus.

2017 - 2019 *PET Imaging of Inflammation and Epigenetics in People with ALS*
Muscular Dystrophy Association
Investigator (PI: Atassi)
This study will determine neuroinflammatiory changes in people with ALS using [^{11}C]PBR28 PET Imaging.

2016 - 2021 *Pathophysiology of postoperative delirium and the use of biomimetic sleep as a treatment strategy in the CSICU*
NIA/R01 AG053582–01
Investigator (PI: Akeju)

2016 – 2022 *In-vivo imaging of spinal and brain glial activation in low back pain patients*
NINDS/R01 NS095937-01A1
PI ($2,060,000 – total direct costs).
The aim of this study is to compare spinal and brain glial activation in healthy volunteers, and patients with subacute (i.e., pain duration between 1 and 3 months) and chronic (i.e., pain duration > 1 year) low back pain, to evaluate spatial and temporal dynamics of glial responses in pain disorders.

2016 – 2023 *The role of brain glial activation in knee osteoarthritis*
NINDS/R01 NS094306-01A1
PI ($2,057,895 – total direct costs).
In this project, we will use PET/MR imaging to test the hypothesis that brain levels of the translocator protein, which is upregulated in activated glial cells, predict the likelihood of developing long-term post-surgical pain in knee osteoarthritis patients.

2019-2022 *A Study of Neuroimmune Mechanisms of Poststroke Fatigue using Integrated PET/MRI*
NIH/NINDS 1R21NS110982-01
Co-PI (Contact PI: Judith Schaechter) ($275,000 – total direct costs)
The proposed study will use PET/MRI scanning to test for the first time whether brain inflammation, and associated abnormalities in brain connectivity, play an important role in post-stroke fatigue.

2019-2022 The Role of Brain Glial Activation in Persistent Pain Following TKA
Orthopaedic Research and Education Foundation
Co-PI (Contact PI: Young-min Kwon) ($300,000 – total direct costs)
This study will investigate differences in neuroinflammation in patients with or without persistent post-surgical pain after total knee arthroplasty

Current

2018 – 2024 *Imaging Neuroglial Mechanisms of neuropathic pain-opioid interaction in HIV*

(NCE) NIDA/R01 1R01 DA047088-01 ($1,840,486 – total direct costs)
Contact PI (co-PI: Eva Ratai)
This project will use PET/MR imaging and ultra-high field MRI and MR spectroscopy to image brain glial activation, neuronal integrity, and chemical neurotransmitter imbalance in HIV-infected patients with and without pain and chronic opioid use. Advancing our understanding of the mechanisms mediating the HIV pain-opioid interaction will have important practical implications for pain management, and toward the development of tailored interventions focused on glial modulation and neurotransmitter signaling.

2018 – 2024 (NCE) *Boosting mind-body mechanisms and outcomes for chronic pain*
NCCIH/1P01AT009965-01
Co-Project Leader (with Nouchine Hadjikhani) (PI: Napadow/Rosen)
We will apply functional MRI, MR spectroscopy and PET to evaluate measures of central sensitization, dysautonomia and neuroinflammation in patients with migraine headache, to evaluate the effect of combined mindfulness meditation training and transcutaneous vagus nerve stimulation therapies

2019-2024 (NCE) *Clarifying the Role Played by Microglia and Astrocyte Activation in Veterans with Gulf War Illness*
DOD / W81XWH1910765
Site PI (PI: Killiany) ($266,462 – total direct costs)
This study will use multiple PET radioligands to disentangle the contribution of microglia and astrocytes to neuroinflammation in Gulf War Illness.

2013-2024 *Neural Substrates of Diffusion Imaging in Cognitively Aging Rhesus Monkeys*
NIH/NIA 2R01AG042512-06
Investigator (PI: Kubicki, Makris, Rosene)
This major goal of this NIA funded project is to use neuroimaging biomarkers of neuroinflammation and myelin degeneration (mainly diffusion and PET imaging) to better characterize biological (neuroinflammatory and epigenetic) signatures of cognitive aging in non-human primates.

2021-2026 *Evaluation of Cannabidiol for Reduction of Neuroinflammation in Chronic Back Pain*
NIH/NIDA 1R01DA053316-01
Contact PI (Co-PI: Jodi Gilman) ($2,242,210 – total direct costs)
The goal of this project is to assess the effect of CBD on neuroinflammation and striatal physiology in chronic low back pain.

2022-2025 *Confirmation of the Low Glutamate Diet as a Treatment for Gulf War Illness*
DoD / W81XWH2220012
Site PI (PI: Holton) ($714,677 – total direct costs)
The goal of this project is to understand the mechanisms underlying the beneficial effects of low glutamate diet in veterans suffering from Gulf War Illness

2022-2027 *The role of neuroinflammation in human peripheral neuropathic pain*
1R01AR079110-01A1
PI (Co-PI: Napadow) ($2,174,640 – total direct costs)
We will evaluate the role of neuroinflammation and neuroplasticity in human carpal tunnel syndrome, as compared to healthy controls

2022-2024 (NCE) *Administrative supplement to Imaging neuroglial mechanisms of neuropathic pain-opioid interaction in HIV*
3R01DA047088-05S1
PI (Co-PI: Ratai) ($706,221 – total direct costs)
The overall goal of this study is to examine the mechanisms of brain injury contributing to Postoperative Neurocognitive Disorders in an at-risk population, Obstructive Sleep Apnea patients, undergoing surgery.

2022-2025 *Non-Invasive Microstructural Assessment of Neuroinflammation in Chronic Pain*
DoD W81XWH2211003
PI ($898,148 – total direct costs)
Aim 1: Assessment of our MCM-based markers of pain-related NI as an objective indicator of pain. Aim 2: Assessment of our MCM-based markers as predictors of long-term (6-months) pain response to TKA.

2022-2027 *From Nerve to Brain: Toward a Mechanistic Understanding of Spinal Cord Stimulation in Human Subjects*
NIH/NINDS 1 RM1 NS128741-01 *(*$5,165,910 – total direct costs)
Co-PI (contact PI: Wainger, co-PI: Freeman)
The major goal of this project is to identify mechanisms of spinal cord stimulation.

2023-2025 *In-vivo Assessment of Neuroinflammation in Painful Trigeminal Neuropathy*
NIH/NIDCR R21DE031410 ($275,000 – total direct costs)
Corresponding PI (PI: Cheng)
The major goal of this project is evaluate the neuroinflammatory components of painful trigeminal neuropathy, using integrated PET/MRI

2023-2027 *Neuro-Psycho-Physiological Profile of Pain Fluctuations in Fibromyalgia*
United States – Israel Binational Science Foundation 2022118 ($236,000 – total costs)
Co-PI (Contact PI: Admon; co-PI: Horesh)
The major goal of this project is to identify biobehavioral mechanisms mediating fluctuations in symptoms severity in individuals with fibromyalgia

Projects submitted for Funding

N/A

Training Grants and Mentored Training Grants

2020-2024 *Musculoskeletal Pain Among Breast Cancer Survivors: Through Bio-behavioral and Imaging Lenses*
NIH/NCI 4K00CA234782-03
Mentor of Yehui Zhu
The proposed training and study are aimed at establishing a unique model integrating neuroimaging, omics and behavioral data to provide greater insight into the inter-individual variability, phenotype, and biological mechanisms of

musculoskeletal pain during the treatment of aromatase inhibitor for breast cancer.

2022-2024 *Mechanisms Mediating Postoperative Neurocognitive Disorders*
NIH/NIGMS K23GM132795
Mentor of Susana Vacas
The main aim of this project is to evaluate mechanisms underlying postoperative neurocognitive disorders using functional and structural MRI

2024-2029 *Unraveling the discordance between structural damage and pain phenotypes in knee osteoarthritis*
NIH/NIAMS 1K23AR084603-01
Mentor of Mohamed Jarraya
The aims of the proposed training and study are to identify joint and muscle MRI and CT imaging markers of neuropathic and nociceptive pain.

Report of Local Teaching and Training

Teaching of Students in Courses

2012	HST583: Functional Magnetic Resonance Imaging: Data Acquisition and Analysis Graduate students, postdoctoral fellows	Massachusetts Institute of Technology (Harvard-MIT Health Sciences and Technology) Single presentation, 1 hour
2015	Human Neuroscience and Behavior 2nd year medical students	Harvard Medical School 4-hr sessions per week, one week
2017	HST583: Functional Magnetic Resonance Imaging: Data Acquisition and Analysis Graduate students, postdoctoral fellows	Massachusetts Institute of Technology (Harvard-MIT Health Sciences and Technology) Single presentation, 1 hour
2019	HST583: Functional Magnetic Resonance Imaging: Data Acquisition and Analysis Graduate students, postdoctoral fellows	Massachusetts Institute of Technology (Harvard-MIT Health Sciences and Technology) Single presentation, 1 hour
2020	MCB148: The Neurobiology of Pain Undergraduate students	Harvard University (remote) Single presentation, 1 hour
2022	BIOS E-52: The Neurobiology of Pain Mixed classroom	Harvard University (remote) Single presentation, 1 hour
2022	HST583: Functional Magnetic Resonance Imaging: Data Acquisition and Analysis Graduate students, postdoctoral fellows	Massachusetts Institute of Technology (Harvard-MIT Health Sciences and Technology) Single presentation, 1 hour

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

2018	"The Life of an Academic" panel, Martinos Career Week	A. A. Martinos Center for Biomedical Imaging
2018	"Making the Most of Your Postdoc" panel, Postdoctoral Division and Mass General Postdoc Association	MGH
2023	Postdoc Retreat Networking Event	MGH
2023	Introduction to gross neuroanatomy (T32 fellows)	A. A. Martinos Center for Biomed. Imaging (remote)

Research Supervisory and Training Responsibilities

2008	Supervision of undergraduate summer student (psychophysical and autonomic nervous system study), Universite' de Montreal	Daily mentorship for three months
2012, 2014	Supervision of students for the Tufts University Community Health Program (PET/MR studies), MGH	3 hours per week for 16 weeks
2014-	Supervision of postdoctoral research fellows (average 3-4 per year)	MGH One hour lab meeting per week; 1:1 supervision one hour per week per fellow; additional group meetings, one hour per week
2014	Supervision of Summer Student, Summer Research Trainee Program (fMRI analysis), MGH	2 hours per week, for 8 weeks
2015 - 2017	Supervision of Massachusetts Institute of Technology M.Eng. Student, MGH	1/2 hour per week, 50 weeks
2016	Supervision of Interns from Harvard University, Northeastern University, MGH	20 hours per week, 20 weeks
2020	Supervision of high school summer interns, MGH	10 hours per week, 4 weeks
2023	North American Pain School, Invited faculty Montebello, QC, Canada	1 week

Formally Mentored Harvard Students (Medical, Dental, Graduate, and Undergraduate)

2016	Hagen Puller, FAS (Molecular and Cellular Biology) Class 2018 Conducted a 9-week research internship in my laboratory.

Mentored Trainees and Faculty

2008	Mylene Juneau, MD / Emergency Medicine Physician *Career stage:* Pre-med student. *Mentoring role:* Research advisor. *Accomplishments:* Accomplishments: Published one manuscript in PAIN and one abstract / poster presentation (IASP)
2012	Elena Hill, MD, MPH / Family Medicine Physician *Career stage:* Medical student. *Mentoring role:* Research advisor. *Accomplishments:* Co-authored one manuscript in Brain.
2014	Violeta Contreras Ramires / Research Fellow, Burke Rehabilitation Hospital *Career stage:* Visiting Student, City College of New York. *Mentoring role:* Co-Preceptor. *Accomplishments:* Published one manuscript in eLife.
2014 - 2018	Daniel S. Albrecht, PhD / Senior Scientist, Neurocrine Biosciences *Career stage:* Research Fellow. *Mentoring role:* Postdoctoral advisor. *Accomplishments:* 20+ co-authored manuscripts, including multiple as first author in Brain Behavior and Immunity, Molecular Psychiatry, Annals of Neurology, Neurology and PAIN. Recipient of the Neuroimaging Pilot Funding Initiative, Martinos Center.
2014 - 2016	Ekaterina Protsenko, MD, MAS / Psychiatry Resident, Stanford University *Career stage*: Research Assistant. *Mentoring role*: Research advisor. *Accomplishments*: Multiple abstracts, co-authored multiple (9) manuscripts including in J Pain, Neuroimage, Brain Behavior and Immunity, Molecular Psychiatry, Arthritis and Rheumatology.
2015 - 2017	Andrew Song, PhD / Research Fellow, Brigham and Women's Hospital, Harvard Medical School *Career stage:* M.Eng thesis mentee (MIT). *Mentoring role:* Research advisor. *Accomplishments:* MSc Eng thesis; Published one manuscript in the Journal of Neuroscience.
2016 - 2018	Courtney Bergan, J.D. / Equal Justice Works Fellow, U Maryland *Career stage:* Clinical Research Coordinator. *Mentoring role:* Research advisor. *Accomplishments:* Multiple abstracts and 4 coauthored papers in Brain Behavior Immunity (2), Molecular Psychiatry, and Neuroimage.
2016 – 2018, 2020 –	Minhae (Ellie) Kim, BA / Program Director *Career stage:* From Clinical Research Coordinator to Program Director. *Mentoring role:* Research advisor. *Accomplishments:* Multiple abstracts and 15+ coauthored papers, including one first-authored paper in Neuroimage; Best Research Staff Abstract, DACCPM Clinical Research Night
2017-2019	Angel Torrado-Carvahal, PhD / Assistant Professor, Universidad Rey Juan Carlos

Career stage: Research Fellow. *Mentoring role:* Postdoctoral advisor.
Accomplishments: Multiple abstracts and 15+ co-authored papers, including 3 as first- or co-first authored papers in Pain (2) and Annals of Biomedical Engineering.
Young Investigator Award, ISOAI, Marrakech, Morocco, 2024

2017-2018 Stefano Bovo, M.Eng / PhD student, Università degli Studi di Padova, Italy
Career stage: M.Eng. thesis mentee (Università degli Studi di Padova). *Mentoring role:* Research advisor.
Accomplishments: MSc Eng thesis; one co-authored manuscript in JCBFM.

2018-2020 Sofia Trogu, M.Sc / Data Scientist at Rozes LLC
Career stage: Intern. *Mentoring role:* Research advisor.

2018-2020 Atreyi Saha, MD
Career stage: Clinical Research Coordinator. *Mentoring role:* Research advisor.
Accomplishments: 4 coauthored papers in Brain, Contemporary Clinical Trials, PAIN and Neuroimage.

2018-2022 Yang Lin, MD / General surgery resident, USC
Career stage: Clinical Research Coordinator. *Mentoring role:* Research advisor.
Accomplishments: 2 coauthored paper in Neurol Neuroimmunol Neuroinflamm and PAIN.

2019-2023 Zeynab Alshelh, PhD / Research Fellow, University of Sydney
Career stage: Research Fellow. *Mentoring role:* Postdoctoral advisor.
Accomplishments: Multiple abstracts and 10+ co-authored papers, including 2 as first author in Brain, and Brain Behavior and Immunity. Additional first-author publication in under review.

2019-2020 Erin Morrissey B.Sc. / MS in Biomedical Science, Tufts University
Career stage: Clinical Research Coordinator. *Mentoring role:* Research advisor.
Accomplishments: co-authored 9 papers, including a first-authored protocol paper in Contemp Clin Trials.

2020-2022 Akila Weerasekera, PhD / Research Fellow, McLean Hospital and Harvard Medical School
Career stage: Research Fellow. *Mentoring role:* Postdoctoral advisor
Accomplishments: Multiple 5 papers, including 3 first- or co-first-authored paper in PAIN (2) and AJNR Am J Neuroradiol.

2020-2022 Paulina Knight, B.Sc. / MD student, University of Queensland
Career stage: Clinical Research Coordinator. *Mentoring role:* Research advisor.
Accomplishments: Co-authored 5 papers, including a co-first-authored manuscript in PAIN

2020-2022 Kelly Castro-Blanco, B.Sc. / MBA Candidate, Duke University
Career stage: Clinical Research Coordinator. *Mentoring role:* Research advisor.
Accomplishments: Co-authored one paper in Brain Behav Immun

2020-2022 Yehui Zhu, PhD / Research Fellow, MGH and Harvard Medical School
Career stage: Research Fellow. *Mentoring role:* Postdoctoral advisor

Accomplishments: Oncology Nursing Foundation Research Grant; one first-authored paper (Clin J Pain), another co-authored paper. One additional first-authored and multiple co-authored manuscript in preparation or under review. **Currently evaluating multiple offers for faculty positions.**

2020-2022 Ludovica Brusaferri, PhD / Senior Lecturer, London South Bank University
Career stage: Research Fellow. *Mentoring role:* Postdoctoral advisor;
Accomplishments: Published 7 papers, including 2 as first author in Brain Behavior and Immunity; additional first-authored papers under review (1) and in preparation (2).

2021-2022 Hope Housman, MSc
Career stage: Clinical Research Coordinator. *Mentoring role:* Research advisor.
Accomplishments: Co-authored one paper in Brain Behav Immun

2021-2024 Angelica Sandström, PhD / Research Fellow, MGH and Harvard Medical School
Career stage: Research Fellow. *Mentoring role:* Postdoctoral advisor
Accomplishments: 3 co-authored manuscripts, including a first-authored paper in PAIN. Another first-authored publication under revisions.
Young Investigator Award, ISOAI, Marrakech, Morocco, 2024

2022- Megan Heffernan, BSc / Clinical Research Coordinator
Career stage: Clinical Research Coordinator. *Mentoring role*: Research advisor
Accomplishments: first-author publication in preparation

2022- Jennifer Murphy, BSc / Clinical Research Coordinator
Career stage: Clinical Research Coordinator. *Mentoring role*: Research advisor
Accomplishments: Co-authored one paper in Brain Behav Immun

2022- Grace Grmek, BSc / Clinical Research Coordinator
Career stage: Clinical Research Coordinator. *Mentoring role*: Research advisor
Accomplishments: Co-authored one paper in Brain Behav Immun

2022- Courtney Chane, BSc / Clinical Research Coordinator
Career stage: Clinical Research Coordinator. *Mentoring role*: Research advisor
Accomplishments: Co-authored one paper in Brain Behav Immun

2022-2024 Jack Schnieders, BSc / MD student
Career stage: Research Assistant. *Mentoring role*: Research advisor
Accomplishments: Co-authored one paper in Brain Behav Immun; first author publication in preparation.

2022-2023 Lucia Maccioni, BSc / PhD Student, Università degli Studi di Padova
Career stage: PhD visiting student (Università degli Studi di Padova). *Mentoring role:* Research advisor. *Accomplishments:* multiple abstracts, three publications, including one first-authored publication. Additional co-authored publications under review.

2023- Keenan Byrne, BA / Clinical Research Coordinator
Career stage: Clinical Research Coordinator. *Mentoring role*: Research advisor

2023- Aarushi Tandon, BSc / Clinical Research Coordinator
Career stage: Clinical Research Coordinator. *Mentoring role*: Research advisor
Accomplishments: co-authored abstract for OHBM.

2023-	Mehrbod Mohammadian, PhD / Research Fellow, Harvard Medical School *Career stage:* Research Fellow. *Mentoring role:* Postdoctoral advisor *Accomplishments:* Two publications, including one first-authored paper in PAIN and one co-authored one paper in Brain Behav Immun. One more first-authored paper, and additional co-authored publication in preparation or under review.
2023	Julie Klinke, BSc / PhD student, Karolinska Institutet *Career stage:* MSc thesis mentee (University of Amsterdam). *Mentoring role:* Research advisor. *Accomplishments*: MSc thesis; first-authored abstract presented at the 2024 IASP World Congress. Co-authored one paper in Brain Behav Immun.
2023-	Natalie Swanson, BA / Research Assistant *Career stage:* Research Assistant. *Mentoring role*: Research advisor
2023-2024	Ava Axelrod, BSc / Research Assistant *Career stage:* Research Assistant. *Mentoring role*: Research advisor
2024-	Margaret Wargo, BS / Research Assistant *Career stage:* Research Assistant. *Mentoring role*: Research advisor
2024-	Thomas Gavin Carmichael, BSc / Research Assistant *Career stage:* Research Assistant. *Mentoring role*: Research advisor
2024-	Joya Cooper-Hohn, BSc / Research Assistant *Career stage:* Research Assistant. *Mentoring role*: Research advisor
2024-	Allyson Zheng, BSc / Research Assistant *Career stage:* Research Assistant. *Mentoring role*: Research advisor

Local Invited Presentations

No presentations below were sponsored by 3rd parties/outside entities.

2007	Empathy affects both sensory and affective components of pain perception / Invited lecture Douglas Hospital, Montreal, QC, Canada
2010	Neural Correlates of Ongoing Chronic Low Back Pain as Measured by Arterial Spin Labeling (ASL) / Invited Brainmap Seminar A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA
2009 - 2019	Seminars of Neuroanatomy (yearly) / Invited Why'n'How Seminars A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA
2011	Neural Correlates of Ongoing Chronic Low Back Pain as Measured by Arterial Spin Labeling (ASL) / Invited lecture Department of Psychiatry, McLean Hospital, Belmont, MA

2012 Assessing microglial activation in chronic pain with integrated MR/PET imaging / Invited lecture
Martinos Center Annual Retreat, Shalin Liu Performance Center, Rockport, MA

2012 The Brain in Chronic Pain: Insights from Arterial Spin Labeling Studies / Invited lecture
Division of Rheumatology, Immunology and Allergy, Brigham and Women's Hospital, Boston, MA

2013 Assessing activation of brain microglia in chronic pain with simultaneous MR-PET / Invited lecture
Harvard Catalyst Advanced Imaging Workshop / Harvard Business School, Allston, MA

2013 Chronic Pain and Microglial Activation: a [11C]PBR28 PET/MR study / Invited Molecular Imaging Seminar
A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

2013 Imaging the brain in chronic pain with arterial spin labeling / Invited lecture
Musculoskeletal Pain Workshop: Riddles and New Ideas / Brigham and Women's Hospital, Boston, MA

2014 Neuroimaging of pain syndromes / Invited Grand Rounds lecture
Department of Rheumatology, Brigham and Women's Hospital, Boston, MA

2014 The Brain in Chronic Pain: Insights from Arterial Spin Labeling Studies / Invited lecture
Osher Center for Integrative Medicine, Brigham and Women's Hospital, Boston, MA

2014 The Human Brain in Chronic Pain: Insights from Neuroimaging / Invited lecture
VA Boston Healthcare System, Jamaica Plain, MA

2015 Evidence for Brain Glial Activation in Chronic Pain / Invited Brainmap seminar
A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

2015 Imaging Chronic Pain / Invited lecture and panel discussion
Harvard Catalyst course, Sheraton Commander Hotel, Cambridge, MA

2016 Imaging Neuroinflammation / Invited Molecular Imaging lecture
A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

2016 The Human Brain in Chronic Pain / Invited lecture
Two-week Multimodality Short Course / A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

2017 Imaging Immune Activation in Chronic Pain / Invited Lunch & Learn seminar
Partners HealthCare corporate campus, Somerville MA

2017 Imaging Neuroinflammation in Chronic Pain / Invited lecture
Center for Depression Anxiety Stress Research, McLean Hospital, Boston MA

2018 TSPO imaging: opportunities and challenges / Invited Kinetic Modelling meeting seminar
A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

2018 Imaging Neuroimmune Activation in Human Pain Disorders / Invited Grand Rounds lecture
Department of Anesthesia, Critical Care and Pain Medicine, Massachusetts General Hospital, Boston, MA

2018 Imaging Neuroimmune Activation in Human Pain Disorders / Invited lecture
Center for Pain and the Brain, Boston Children's Hospital, Boston MA

2018 Imaging Neuroimmune Activation in Human Pain Disorders / Invited lecture
Pain Special Interest Group, Dept. Rehabilitation Services, Brigham and Women's Hospital, Boston, MA

2018 Imaging the Inflamed Brain / Invited Science on Tap talk
A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

2018 Second generation TSPO radioligands as a tool to image neuroinflammation in chronic pain / Invited Molecular Imaging Symposium talk
A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

2019 Neuroinflammation in Human Chronic Musculoskeletal Disorders / Invited Grand Rounds lecture
Department of Rheumatology, Massachusetts General Hospital, Boston, MA

2019 Is neuroinflammation a therapeutic target for back pain? / Invited lecture
MGH Charlestown HealthCare Center

2019 Imaging neuroinflammation in human disorders / Invited lecture
2019 MGH Summer Research Enrichment Program

2020 Imaging pain and neuroinflammation in humans / Invited lecture
Spaulding Rehabilitation Hospital

2020 Imaging the inflamed brain / Invited lecture
2020 MGH Summer Research Enrichment Program

2021 Neuroinflammation: is there a role in human pain? / Keynote lecture
Brigham and Women's Anesthesia Department Research retreat / MIT Endicott house, Dedham MA.

2021 PET / MRI synergy / Invited lecture
2021 Spring Research Enrichment Program

2023 Does neuroinflammation have a role in human facial pain? / MGH Multidisciplinary Facial Pain Conference / Invited lecture
Massachusetts General Hospital, Neurology Department

2024	Imaging brain and body inflammation in chronic pain / Invited Brainmap seminar A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

Report of Regional, National and International Invited Teaching and Presentations

No presentations below were sponsored by 3rd parties/outside entities.

Regional

2015	Glial cells and human pain / Invited lecture Gulf War Illness Consortium meeting, Boston University, Boston, MA
2016	The Human Brain in Chronic Pain / Invited lecture World Preclinical Congress, Boston, MA
2018	Imaging Neuroinflammation in Gulf War Illness Gulf War Illness Consortium meeting, Boston University, Boston, MA
2019	Imaging Neuroinflammation in Human Disorders Worcester Polytechnic Institute, Worcester MA
2019	Imaging Neuroinflammation in Human Disorders Boston University, Department of Anatomy and Neurobiology

National

2011	The Brain in Chronic Pain: Insights from Arterial Spin Labeling Studies / Invited lecture University of Michigan, Ann Arbor, MI
2012	Chronic low back pain patients (CLBP) display altered brain connectivity in the Default Mode Network / Invited Plenary talk *(selected as Best Abstract)* American Academy of Pain Medicine, Palm Springs, CA
2013	Novel Approaches to Investigate the Human Brain in Chronic Pain: Insights from Arterial Spin Labeling and Microglial Activation (TSPO) Imaging / Invited lecture National Center for Complementary and Alternative Medicine (NCCAM), National Institutes of Health, Bethesda, MA
2014	The Human Brain in Chronic Pain: Insights from Neuroimaging / Invited lecture Eli Lilly, Indianapolis, IN
2014	Evidence of Brain Glial Activation in Chronic Pain Patients / Nanosymposium talk (selected oral abstract) 44th Annual Meeting of the Society for Neuroscience, Washington, DC

2015	The Role of Glial Cells in Human Pain / Invited lecture State-of-the-Art in Spine Control Symposium, Chicago IL
2016	The Human Brain in Chronic Pain / Invited lecture University of Pittsburgh, Pittsburgh, PA
2016	The Human Brain in Chronic Pain / Invited lecture University of Iowa, Iowa City, IA
2016	The Human Brain in Chronic Pain / Keynote Talk Indianapolis Chapter of the Society for Neuroscience, Indianapolis, IN
2016	Imaging Glial Activation in Human Pain Disorders / Invited lecture 11th Annual NIH Pain Consortium on Advances in Pain Research, Bethesda, MD
2018	TSPO imaging as a tool to image neuroinflammation in chronic pain NIH Pain Special Interest Group, Bethesda, MD
2019	Striatal hypofunction as a neural correlate of mood alterations in chronic pain patients (selected oral abstract) 49th Annual Meeting of the Society for Neuroscience, Chicago, IL
2019	Imaging Neuroinflammation in Pain and Neurological Disorders / Invited Grand Rounds lecture Department of Neurology, University of Pennsylvania, Philadelphia PA
2020	Imaging Neuroinflammation in Human Pain Disorders Department of Anesthesiology, Northwestern University, Chicago, IL (*remote talk*)
2021	Neuroinflammatory signatures in human chronic pain / invited talk University of Texas Medical Branch (*remote talk*)
2021	Neuroimmune signatures in human chronic pain / Spotlight Session / Speaker World Molecular Imaging Congress (*remote talk*)
2021	Towards neuroinflammatory PET signatures of human pain disorders / Minisymposium talk (selected oral abstract) 50th Annual Meeting of the Society for Neuroscience (*remote talk*).
2022	Imaging neuroinflammation in fibromyalgia and other pain conditions / invited talk Fibromyalgia Community Conference (*remote talk*)
2022	Imaging a double-hit: neuroglial dysregulation in PASC and HIV / invited talk NIH RECOVER NOSI investigator meeting (*remote talk*)
2023	From brain to joint: imaging pain-related inflammation in humans using integrated PET-MRI / 16th Annual Joseph W. Howe Oration in Diagnostic Imaging Logan University, Chesterfield, MO
2024	Chronic pain and brain inflammation / Invited Pain Grand Rounds lecture Department of Anesthesia, UC San Diego (remote)

International

2010	Clinical pain and Functional Magnetic Resonance Imaging: An Arterial Spin Labeling study on patients with chronic low back / Invited lecture University of Pavia, Italy
2014	Disrupted brain circuitry for pain-related reward/punishment in fibromyalgia / Invited lecture International Narcotics Research Conference, Montreal, QC, Canada
2015	The role of glia in pain disorders: from rodents to humans / Workshop / Chair and speaker The Fifth International Congress on Neuropathic Pain (NeuPSIG), Nice, France
2017	Imaging glial activation in patients with chronic pain / Workshop / Speaker The Sixth International Congress on Neuropathic Pain (NeuPSIG), Gothenberg, Sweden
2018	TSPO imaging as a tool to image neuroinflammation in chronic pain / Invited lecture King's College, London UK
2018	TSPO imaging as a tool to image neuroinflammation in chronic pain / Invited lecture University of Oxford, Oxford, UK
2018	Imaging neuroinflammation in human pain disorders / Keynote lecture "Pain, Mind & Movement: Applying science to the clinic", Satellite to the 17th IASP World Congress on Pain, Boston, MA
2018	Second generation TSPO radioligands as a tool to image neuroinflammation in chronic pain / Workshop / Speaker The 17th IASP World Congress on Pain, Boston, MA
2019	The Translocator Protein (TSPO) as a tool to image neuroinflammation in chronic pain. / Workshop / Speaker EFIC Congress 2019 – Pain in Europe XI, Valencia Spain.
2021	Neuroinflammatory signatures in human chronic pain / Plenary talk Pain Centre Versus Arthritis & Precision Imaging Beacon, University of Nottingham (Virtual)
2021	The role of brain inflammation in human chronic pain / Invited Grand Rounds Department of Neurology, University Hospital, Basel, Switzerland (Virtual)
2021	The role of brain inflammation in human chronic pain / Invited talk University of Toronto (Virtual)
2023	From brain to joint, imaging pain-related inflammation in humans using integrated PET/MRI / Invited talk University of Toronto
2023	From brain to knee, in-vivo imaging of inflammation in human chronic pain / Invited talk North American Pain School, Montebello, QC, Canada

2024	Neuroinflammatory signatures of human chronic pain / Invited Seminar Frontiers in Pain Research Seminar Series, McGill University, Montreal, Canada
2024	Pain, brain inflammation and the pandemic / Session Chair and speaker Pain Mechanisms and Therapeutics Conference, Verona, Italy
2024	**Neuroinflammation: does it have a role in human chronic pain? / Invited Plenary Lecture** **World Congress on Pain, Amsterdam, The Netherlands**
2024	Neuroinflammation and chronic pain: insights from multimodal imaging / Invited Seminar Department of Clinical Neuroscience, Karolinska Institutet, Stokholm, Sweden (Virtual)
2025 (pending)	**Neuroinflammation and chronic pain: what has imaging taught us so far? / Invited Plenary Lecture** **14th Congress of the European Pain Federation EFIC – Pain in Europe, Lyon France**
2025 (pending)	**Human Chronic Pain and Neuroinflammation / Juan Antonio Mico Plenary Lecture.** **21th Congress of the Spanish Pain Society, Malaga, Spain**

Report of Technological and Other Scientific Innovations

Imaging Glia-mediated NeuroInflammation and Treatment Efficacy (the IGNITE study) (2017)	Investigational New Drug Application #135359, Sponsor-Investigator My lab has developed an experimental method to evaluate the potential anti-neuroinflammatory properties of the antibiotic minocycline. The assessment of this method is currently ongoing.
Assessing Neuroinflammation in Pain Disorders with [^{11}C]PBR28 PET/MRI	Investigational New Drug Application #142546, Sponsor-Investigator This IND covers the use of [^{11}C]PBR28 to investigate the role of neuroinflammation in various pain disorders, including in clinical trials.

Report of Education of Patients and Service to the Community

No presentations below were sponsored by outside entities

Recognition

2006	JNeurosci paper featured in the TV show “Découverte” (“Le syndrome d’insensibilité à la douleur”)	Radio-Canada (CBC)
2009	Interview to comment on a paper published by Dazinger et al in Neuron	Science News

2011	Publicity on Anesthesiology manuscript on arterial spin labeling	ABC News, Pain Research Forum, Science Daily, International Business Times, News Medical, Harvard Medicine News
2012	Publicity on PAIN manuscript on arterial spin labeling functional connectivity	Medscape, PR Newswire
2013	Publicity on Arthritis & Rheumatology manuscript on fibromyalgia	US News & World Report, News Medical ("Thought Leaders Series"), Fox5, Health Day News, HMS News Clips
2014	Interview on my work on empathy for pain	Judy Foreman's book (A Nation in Pain, Oxford University Press)
2015 - 2016	Publicity on Brain manuscript on glial activation in chronic pain patients	Massachusetts General Hospital press release, Harvard Gazette, Scientific American, Popular Science, Aunt Minnie, Fox News, US News and World Report, Venerdi' di Repubblica (Italian), Apotheken Umschau (German), New Scientist and others.
2016	Interview on our Brain 2015 paper	The New Scientist
2016	Work featured as award recipient	Pain Research Forum
2017	Interview on fibromyalgia	HealthDay
2018	Publicity on PAIN manuscript on neuroinflammation in sciatica	Massachusetts General Hospital press release, Neuroscience News, Science Daily, News Medical and others
2018	Publicity on Brain, Behavior and Immunity manuscript on neuroinflammation in fibromyalgia	Massachusetts General Hospital press release, MGH Research Institute blog, Neuroscience News, Science Daily, EurekaAlert, Drugs.com, US. News and World Report, WebMD, UPI.com, ABC, Fox and NBC networks, Sky24 (Italian), and others
2019	Mention of work in article on identifying objective measures of pain in the brain	The Washington Post
2020	Publicity on Brain, Behavior and Immunity manuscript on neuroinflammation in Gulf War Illness	Massachusetts General Hospital press release, The Boston Herald, Science Daily, EurekaAlert, and others
2021	Featured in podcast on graduate studies and mental health	Nurau's "Master your PhD" (10/29/21; "Superparent" episode)

2022	"Pandemic Brain" study featured in podcast	BuzzFeed Daily (12/10/21, "'Pandemic Brain' Is a Real Thing and Now Harvard Scientists Are Studying It")
2022	"Pandemic Brain" study featured in multiple media outlets, including video and radio interviews	Massachusetts General Hospital press release, Harvard Gazette, The Boston Globe, Boston.com, NBC Boston, WCBV, WBZ News, NPR (WBUR, GBH radio), Medscape
2023	Interview to comment on a paper published by Shirvalkar et al in Nature Neuroscience	New Scientist

Report of Scholarship

Peer-Reviewed Scholarship in print or other media

Research Investigations

*=equal contribution
#=first/co-first author is a mentee

1. **Loggia ML**, Mogil JS, Bushnell MC. Empathy hurts: compassion for another increases both sensory and affective components of pain perception. Pain. 2008 May;136(1-2):168-76. doi: 10.1016/j.pain.2007.07.017. PMID: 17822850

2. **Loggia ML**, Mogil JS, Bushnell MC. Experimentally induced mood changes preferentially affect pain unpleasantness. J Pain. 2008 Sep;9(9):784-91. doi: 10.1016/j.jpain.2008.03.014. PMID: 18538637

3. **Loggia ML**, Bushnell MC, Tétreault M, Thiffault I, Bhérer C, Mohammed NK, Kuchinad AA, Laferrière A, Dicaire MJ, Loisel L, Mogil JS, Brais B. Carriers of recessive WKN1/HSN2 mutations for hereditary sensory and autonomic neuropathy type 2 (HSAN2) are more sensitive to thermal stimuli. J Neurosci. 2009 Feb 18;29(7):2162-6. doi: 10.1523/JNEUROSCI.4633-08.2009. PMID: 19228968

4. Kong J, **Loggia ML**, Zyloney C, Tu P, LaViolette P, Gollub RL. Exploring the brain in pain: activations, deactivations and their relation. Pain. 2010 Feb;148(2):257-267. doi: 10.1016/j.pain.2009.11.008. PMID: 20005043

5. Campbell CM, Witmer K, Simango MB, Carteret A, **Loggia ML**, Campbell JN, Haythornthwaite JA, Edwards RR. Catastrophizing delays the analgesic effect of distraction. Pain. 2010 May;149(2):202-207. doi: 10.1016/j.pain.2009.11.012. PMID: 20188470

6. **Loggia ML***, Jensen KB*, Gollub RL, Wasan AD, Edwards RR, Kong J. The catechol-O-methyltransferase (COMT) val^{158}met polymorphism affects brain responses to repeated painful stimuli. PLoS One. 2011;6(11):e27764. doi: 10.1371/journal.pone.0027764. PMID: 22132136

7. **Loggia ML**, Juneau M, Bushnell MC. Autonomic responses to heat pain: heart rate, skin conductance, and their relation to verbal ratings and stimulus intensity. Pain. 2011 Mar;152(3):592-598. doi: 10.1016/j.pain.2010.11.032. PMID: 21215519

8. Wasan AD*, **Loggia ML*,** Chen LQ, Napadow V, Kong J, Gollub RL. Neural correlates of chronic low back pain as measured by arterial spin labeling. Anesthesiology. 2011 Aug;115(2):364-74. doi: 10.1097/ALN.0b013e318220e880. PMID: 21720241

9. **Loggia ML**, Edwards RR, Vangel MG, Wasan AD, Kim J, Gollub RL, Harris RE, Park K, Napadow V. Disentangling linear and nonlinear brain responses to evoked deep tissue pain. Pain. 2012 Oct;153(10):2140-2151. doi: 10.1016/j.pain.2012.07.014. PMID: 22883925
   - *Study featured on issue cover*

10. **Loggia ML**, Kim J, Gollub RL, Vangel MG, Kirsch I, Kong J, Wasan AD, Napadow V. Default mode network connectivity encodes clinical pain: an arterial spin labeling study. Pain. 2013 Jan;154(1):24-33. doi: 10.1016/j.pain.2012.07.029. PMID: 23111164
    - *Study featured on Editorial*

11. Kim J, **Loggia ML**, Edwards RR, Wasan AD, Gollub RL, Napadow V. Sustained deep-tissue pain alters functional brain connectivity. Pain. 2013 Aug;154(8):1343-51. doi: 10.1016/j.pain.2013.04.016. Epub 2013 Apr 11. PMID: 23718988

12. Kong J, Spaeth RB, Wey HY, Cheetham A, Cook AH, Jensen KB, Tan Y, Liu H, Wang D, **Loggia ML**, Napadow V, Smoller J, Wasan AD, Gollub RL. S1 is associated with chronic low back pain: a functional and structural MRI study. Mol Pain. 2013 Aug 21;9:43. doi: 10.1186/1744-8069-9-43. PMID: 23965184

13. **Loggia ML**, Berna C, Kim J, Cahalan CM, Gollub RL, Wasan AD, Harris RE, Edwards RR, Napadow V. Disrupted brain circuitry for pain-related reward/punishment in fibromyalgia. Arthritis Rheumatol. 2014 Jan;66(1):203-12. doi: 10.1002/art.38191. PMID: 24449585
    - *Selected by Editor-in-chief for journal press release*
    - *Included in the journal's "In this Issue" highlights*

14. Napadow V, Li A., **Loggia ML**, Kim J, Schalock PC, Lerner E, Tran TN, Ring J, Rosen BR, Kaptchuk TJ, Pfab F. The brain circuitry mediating antipruritic effects of acupuncture. Cereb Cortex. 2014 Apr;24(4):873-82. doi: 10.1093/cercor/bhs363. PMID: 23222890

15. Coombs G, **Loggia ML**, Greve DN, Holt DJ. Amygdala perfusion is predicted by its functional connectivity with the ventromedial prefrontal cortex and negative affect. PLoS One. 2014 May 9;9(5):e97466. doi: 10.1371/journal.pone.0097466. eCollection 2014. PMID: 24816735

16. Dolman AJ, **Loggia ML**, Edwards RR, Gollub RL, Kong J, Napadow V, Wasan AD. Phenotype matters: the absence of a positive association between cortical thinning and chronic low back pain when controlling for salient clinical variables. Clin J Pain. 2014 Oct;30(10):839-45. doi: 10.1097/AJP.0000000000000043. PMID: 24135900

17. Akeju O*, **Loggia ML***, Catana C, Pavone KJ, Vazquez R, Rhee J, Contreras Ramirez V, Chonde DB, Izquierdo-Garcia D, Arabasz G, Hsu S, Habeeb K, Hooker JM, Napadow V, Brown EN, Purdon PL. Disruption of thalamic functional connectivity is a neural correlate of dexmedetomidine-induced unconsciousness. Elife. 2014 Nov 28;3:e04499. doi: 10.7554/eLife.04499. PMID: 25432022

18. Desbordes G, Li A, **Loggia ML**, Kim J, Schalock PC, Lerner E, Tran TN, Ring J, Rosen BR, Kaptchuk TJ, Pfab F, Napadow V. Evoked itch perception is associated with changes in functional brain connectivity. Neuroimage Clin. 2014 Dec 3;7:213-21. doi: 10.1016/j.nicl.2014.12.002. eCollection 2015. PMID: 25610783

19. Zürcher NR, **Loggia ML**, Lawson R, Chonde D, Izquierdo-Garcia D, Yasek JE, Johnson-Akeju O, Catana C, Rosen BR, Cudkowicz M, Hooker JM, Atassi N. Increased in vivo Glial Activation in People with Amyotrophic Lateral Sclerosis (ALS): assessed with [^{11}C]-PBR28. Neuroimage Clin. 2015 Jan 19;7:409-14. doi: 10.1016/j.nicl.2015.01.009. eCollection 2015. PMID: 25685708

20. **Loggia ML**, Chonde DB, Akeju O, Arabasz G, Catana C, Edwards RR, Hill E, Hsu S, Izquierdo-Garcia D, Ji RR, Riley M, Wasan AD, Zurcher NR, Albrecht DS, Vangel MG, Rosen BR, Napadow V, Hooker JM. Evidence for brain glial activation in chronic pain patients. Brain. 2015 Mar;138(Pt 3):604-15. doi: 10.1093/brain/awu377. Epub 2015 Jan 12. PMID: 25582579
    - *Most cited article published by the journal Brain in 2015-2016.*

21. Kim HJ, Kim J, **Loggia ML**, Cahalan C, Garcia R, Vangel M, Wasan AD, Edwards RR, Napadow V. Fibromyalgia is characterized by altered frontal and cerebellar structural covariance brain networks. Neuroimage Clin. 2015 Mar 4;7:667-77. doi: 10.1016/j.nicl.2015.02.022. eCollection 2015. PMID: 25844321

22. Kim J, **Loggia ML**, Cahalan C, Harris RE, Beissner F, Garcia R, Kim HJ, Wasan AD, Edwards RR, Napadow V. The somatosensory link in fibromyalgia: functional connectivity of the primary somatosensory cortex is altered by sustained pain and is associated with clinical/autonomic dysfunction. Arthritis Rheumatol. 2015 May;67(5):1395-1405. doi: 10.1002/art.39043. PMID: 25622796

23. **Loggia ML**, Berna C, Kim J, Cahalan CM, Martel MO, Gollub RL, Wasan AD, Napadow V, Edwards RE. The lateral prefrontal cortex mediates the hyperalgesic effects of negative cognitions in chronic pain patients. J Pain. 2015 Aug;16(8):692-9. doi: 10.1016/j.jpain.2015.04.003. PMID: 25937162

24. Napadow V, Li A., **Loggia ML**, Kim J, Mawla I, Desbordes G, Schalock PC, Lerner E, Tran TN, Ring J, Rosen BR, Kaptchuk TJ, Pfab F. The imagined itch: brain circuitry supporting nocebo-induced itch in atopic dermatitis patients. Allergy. 2015 Nov;70(11):1485-92. doi: 10.1111/all.12727. PMID: 26280659

25. Ibinson JW, Vogt KM, Taylor KB, Dua SB, Becker CJ, **Loggia M**, Wasan AD. Optimizing and interpreting insular functional connectivity maps obtained during acute experimental pain: The effects of global signal and task-paradigm regression. Brain Connect. 2015 Dec;5(10):649-657. PMID: 26061382.

26. Herranz E, Giannì C, Louapre C, Treaba CA, Govindarajan ST, Ouellette R, **Loggia ML**, Sloane JA, Madigan N, Izquierdo-Garcia D, Ward N, Mangeat G, Granberg T, Klawiter EC, Catana C, Hooker JM, Taylor N, Ionete C, Kinkel RP, Mainero C. Neuroinflammatory component of gray matter pathology in multiple sclerosis. Ann Neurol. 2016 Nov;80(5):776-790. doi: 10.1002/ana.24791. PMID: 27686563

27. Alshikho MJ, Zürcher NR, **Loggia ML**, Cernasov P, Chonde DB, Izquierdo Garcia D, Yasek JE, Akeju O, Catana C, Rosen BR, Cudkowicz ME, Hooker JM, and Atassi N. Glial activation colocalizes with structural abnormalities in amyotrophic lateral sclerosis. Neurology. 2016 Dec 13;87(24):2554-2561. doi: 10.1212/WNL.0000000000003427. PMID: 27837005

28. Lazaridou A, Kim J, Cahalan C, **Loggia ML**, Franceschelli O, Berna C, Schur P, Napadow V, Edwards RR. Effects of cognitive-behavioral therapy on brain connectivity supporting catastrophizing in fibromyalgia. Clin J Pain. 2017 Mar;33(3):215-221. doi: 10.1097/AJP.0000000000000422. PMID: 27518491

29. Hashmi JA, **Loggia ML**, Khan S, Gao L, Kim J, Napadow V, Brown EN, Akeju O. Dexmedetomidine disrupts the local and global efficiency of large-scale brain networks. Anesthesiology. 2017 Mar;126(3):419-430. doi: 10.1097/ALN.0000000000001509. PMID: 28092321

30. Schreiber KL*, **Loggia ML***, Kim J, Cahalan CM, Napadow V, Edwards RR. Painful after-sensations in fibromyalgia are linked to catastrophizing and differences in brain response in the medial temporal lobe. J Pain. 2017 Jul;18(7):855-867. doi: 10.1016/j.jpain.2017.02.437. PMID: 28300650.
    - *Featured on issue cover*

31. #Song A, Kucyi A, Napadow V, Brown EN, **Loggia ML***, Akeju O*. Pharmacological modulation of noradrenergic arousal circuitry disrupts functional connectivity of the locus coeruleus in humans. J Neurosci. 2017 Jul 19;37(29):6938-6945. doi: 10.1523/JNEUROSCI.0446-17.2017. PMID: 28626012

32. Lee J, Lin R, Garcia RG, Kim J, Kim H, **Loggia ML**, Mawla I, Wasan AD, Edwards RR, Rosen BR, Hadjikhani N, Napadow V. Reduced insula habituation associated with amplification of trigeminal brainstem input in migraine. Cephalalgia. 2017 Oct;37(11):1026-1038. doi: 10.1177/0333102416665223. PMID: 27521844

33. #Albrecht DS, Normandin MD, Shcherbinin S, Wooten DW, Schwarz AJ, Zürcher NR, Barth VN, Guehl NJ, Akeju O, Atassi N, Veronese M, Turkheimer F, Hooker JM, **Loggia ML**. Pseudo-reference regions for glial imaging with ^{11}C-PBR28: investigation in two clinical cohorts. J Nucl Med. 2018 Jan;59(1):107-114. doi: 10.2967/jnumed.116.178335. PMID: 28818984

34. Paganoni S, Alshikho MJ, Zürcher NR, Cernasov P, Babu S, **Loggia ML**, Chan J, Chonde DB, Izquierdo-Garcia D, Catana C, Rosen BR, Cudkowicz ME, Cudkowicz ME, Atassi N. Imaging of glia activation in people with primary lateral sclerosis. Neuroimage Clin. 2017 Oct 25;17:347-353. doi: 10.1016/j.nicl.2017.10.024. eCollection 2018. PMID: 29159046

35. Ran CZ*, #Albrecht DS*, Yang J, Yang J, Liang SH, **Loggia ML**, Atassi N, Moore A. PET imaging of human brown adipose tissue with TSPO tracer PBR28. Mol Imaging Biol. 2018 Apr;20(2):188-193. doi: 10.1007/s11307-017-1129-z. PMID: 28983743

36. Shelton KT, Qu J, Brown EN, Burns S, Cudemus G, Deng H, Demircioglu G, DiBiasio A, Hahm YH, Hobbs LE, Houle TT, Ibala R, **Loggia ML**, Pavone KJ, Shaefi S, Westover MB, Akeju O. Minimizing ICU Neurological Dysfunction with Dexmedetomidine-induced Sleep (MINDDS): protocol for a randomized, double blind, parallel-arm, placebo-controlled trial. BMJ Open. 2018 Apr 20;8(4):e020316. doi: 10.1136/bmjopen-2017-020316. PMID: 29678977

37. #Albrecht DS, Ahmed S, Kettner N, Borra R, Cohen-Adad J, Deng H, Houle T, Opalacz A, Roth S, Vidal Melo M, Chen L, Mao J, Hooker JM, **Loggia ML*, Zhang Y*.** Neuroinflammation of the spinal cord and nerve roots in chronic radicular pain patients. Pain. 2018 May;159(5):968-977. doi: 10.1097/j.pain.0000000000001171. PMID: 29419657

38. Alshikho MJ, Zürcher NR, **Loggia ML**, Cernasov P, Reynolds B, Pijanowski O, Chonde DB, Izquierdo-Garcia D, Mainero C, Catana C, Chan J, Babu S, Paganoni S, Hooker JM, Atassi N. Integrated MRI and [^{11}C]-PBR28 PET Imaging in Amyotrophic Lateral sclerosis. Ann Neurol. 2018 Jun;83(6):1186-1197. doi: 10.1002/ana.25251. PMID: 29740862

39. Lee JC, Protsenko E, Lazaridou A, Franceschelli O, Ellingsen DM, Mawla IM, Isenburg K, Berry MP, Galenkamp L, **Loggia ML**, Wasan AD, Edwards RR, Napadow V. Encoding of self-referential pain catastrophizing in posterior cingulate cortex in fibromyalgia. Arthritis Rheumatol. 2018 Aug;70(8):1308-1318. doi: 10.1002/art.40507. PMID: 29579370

40. Ratai EM*, Alshikho MJ*, Zurcher NR, **Loggia ML**, Cebulla C, Cernasov PM, Reynolds B, Fish J, Seth R, Babu S, Paganoni S, Hooker JM, Atassi N. Integrated imaging of [^{11}C]-PBR28 PET, MR diffusion

and magnetic resonance spectroscopy in amyotrophic lateral sclerosis. Neuroimage Clin. 2018 Aug 9;20:357-364. doi: 10.1016/j.nicl.2018.08.007. eCollection 2018. PMID: 30112276

41. Ellingsen DM, Napadow V, Protsenko E, Mawla I, Kowalski MH, Swensen D, O'Dwyer-Swensen D, Edwards RR, Kettner N, **Loggia ML**. Brain mechanisms of anticipated painful movements and their modulation by Manual Therapy in chronic low back pain. J Pain. 2018 Nov;19(11):1352-1365. doi: 10.1016/j.jpain.2018.05.012. PMID: 30392530

42. Lois C, Gonzalez I, Izquierdo-Garcia D, Zürcher NR, Wilkens P, **Loggia ML**, Hooker JM, Rosas HD. Neuroinflammation in Huntington's disease: new insights with [^{11}C]PBR28 PET/MRI. ACS Chem Neurosci. 2018 Nov 21;9(11):2563-2571. doi: 10.1021/acschemneuro.8b00072. PMID: 29719953

43. #Albrecht DS*, Forsberg A*, Sandström A, Bergan C, Kadetoff D, Protsenko E, Lampa J, Lee YC, Höglund CO, Catana C, Cervenka S, Akeju O, Lekander M, Cohen G, Halldin C, Taylor N, Kim M, Hooker JM, Edwards RR, Napadow V, Kosek E*, **Loggia ML***. Brain glial activation in fibromyalgia: a multi-site positron emission tomography study. Brain Behav Immun. 2019 Jan;75:72-83. doi: 10.1016/j.bbi.2018.09.018. PMID: 30223011
    - *Featured on the New England Journal of Medicine Journal Watch*

44. Gilbert TM, Zürcher NR, Wu CJ, Bhanot A, Hightower BG, Kim M, Albrecht DS, Wey HY, Schroeder FA, Rodriguez-Thompson A, Morin TM, Hart KL , Pellegrini A, Riley MM, Wang C, Stufflebeam SM, Haggarty SJ, Holt DJ, **Loggia ML**, Perlis RH, Brown HE, Roffman JL, Hooker JM. Neuroepigenetic imaging reveals dysregulation in schizophrenia. J Clin Invest. 2019 Jan 2;129(1):364-372. doi: 10.1172/JCI123743. PMID: 30530989

45. Lee Y, Fine A, Protsenko E, Massarotti E, Edwards RR, Mawla I, Napadow V, **Loggia ML**. Brain correlates of continuous pain in rheumatoid arthritis as measured by pulsed arterial spin labeling. Arthritis Care Res. 2019 Feb;71(2):308-318. doi: 10.1002/acr.23601. PMID: 29781581

46. Paganoni S, Alshikho MJ, Luppino S, Chan J, Pothier L, Schoenfeld D, Andres PL, Babu S, Zürcher NR, **Loggia ML**, Barry RL, Luotti S, Nardo G, Trolese MC, Pantalone S, Bendotti C, Bonetto V, De Marchi F, Rosen BR, Hooker JM, Cudkowicz M, Atassi N. A Pilot Trial of RNS60 in Amyotrophic Lateral Sclerosis. Muscle Nerve. 2019 Mar;59(3):303-308. doi: 10.1002/mus.26385. PMID: 30458059

47. Lee JC*, Mawla I*, Kim J, **Loggia ML**, Ortiz A, Jung C, Chan ST, Gerber J, Schmithorst VJ, Edwards RR, Wasan AD, Berna C, Kong J, Kaptchuk T, Gollub RL, Rosen BR, Napadow V. Machine learning-based prediction of clinical pain using multimodal neuroimaging and autonomic metrics. Pain. 2019 Mar;160(3):550-560. doi: 10.1097/j.pain.0000000000001417. PMID: 30540621
    - *Featured on issue cover*

48. #Albrecht DS, Mainero C, Ichijo E, Ward N, Granziera C, Zürcher NR, Akeju O, Bonnier G, Price J, Hooker JM, Napadow V, **Loggia ML***, Hadjikhani N*. Imaging of neuroinflammation in migraine with aura – a [^{11}C]PBR28 PET/MR study. Neurology. 2019 Apr 23;92(17):e2038-e2050. doi: 10.1212/WNL.0000000000007371. PMID: 30918090

49. Kim J, Mawla I, Kong J, Lee JC, Gerber J, Ortiz A, Kim H, Chan ST, **Loggia ML**, Wasan AD, Edwards RR, Gollub RL, Rosen BR, Napadow V. Somatotopically-specific primary somatosensory connectivity to salience and default mode networks encodes clinical pain. Pain. 2019 Jul;160(7):1594-1605. doi: 10.1097/j.pain.0000000000001541. PMID: 30839429

50. Katsumi Y*, Racine A*, Torrado-Carvajal A., **Loggia ML**, Hooker JM, Greve DN, Hightower BG, Catana C., Cavallari M, Arnold SE, Fong TG, Vasunilashorn SM, Marantonio ER, Schmitt EM, Xu G, Libermann

T, Barrett LF, Inouye SK*, Dickerson BC*, Touroutoglou A*, Collins JA* for the RISE Study Group. The Role of Inflammation after Surgery for Elders (RISE) study: Examination of [^{11}C] PBR28 binding and exploration of its link to post-operative delirium. Neuroimage Clin. 2020;27:102346. doi: 10.1016/j.nicl.2020.102346. PMID: 32712451

51. Barletta BT, Herranz E, Treaba CA, Ouellette R, Mehndiratta A, **Loggia ML**, Klawiter EC, Ionete C, Sloan JA, Mainero C. Evidence of diffuse cerebellar neuroinflammation in multiple sclerosis by 11C-PBR28 MR-PET. Mult Scler. 2020 May;26(6):668-678. doi: 10.1177/1352458519843048. PMID: 30973800

52. #Kim M, Mawla I, Albrecht DS, Admon R, Torrado-Carvajal A, Bergan C, Protsenko E, Kumar P, Edwards RR, Saha A, Napadow V, Pizzagalli DA, **Loggia ML**. Striatal hypofunction as a neural correlate of mood alterations in chronic pain patients. Neuroimage. 2020 May 1;211:116656. doi: 10.1016/j.neuroimage.2020.116656. PMID: 32068162
    - *Featured on issue cover*

53. Hadjikhani N, Albrecht DS, Mainero C, Ichijo E, Ward N, Granziera C, Zürcher NR, Akeju O, Bonnier G, Price J, Hooker JM, Napadow V, Nahrendorf M, **Loggia ML***, Moskowitz MA*. Extra-axial inflammatory signal in parameninges in migraine with visual aura. Ann Neurol. 2020 Jun;87(6):939-949. doi: 10.1002/ana.25731. PMID: 32239542.

54. Jung CJ, Ichesco E, Ratai EM, Gonzalez RG, Burdo T, **Loggia ML**, Harris RH, Napadow V. Magnetic resonance imaging of neuroinflammation in fibromyalgia – a role for astrogliosis? Pain. 2020 Jul;161(7):1555-1564. doi: 10.1097/j.pain.0000000000001815. PMID: 31990749

55. Hubbard C, Lazaridou A, Cahalan CM, Kim J, Edwards RR, Napadow V, **Loggia ML**. Aberrant salience? Brain hyperactivation in response to pain onset and offset in fibromyalgia. Arthritis Rheumatol. 2020 Jul;72(7):1203-1213. doi: 10.1002/art.41220. PMID: 32017421.

56. #Alshelh Z*, #Albrecht DS*, Bergan C, Akeju O, Clauw DJ, Conboy L, Edwards RR, Kim M, Lee YL, Napadow V, Protsenko E, Sullivan K, **Loggia ML**. In-vivo imaging of neuroinflammation in veterans with Gulf War Illness. Brain Behav Immun. 2020 Jul;87:498-507. doi: 10.1016/j.bbi.2020.01.020. PMID: 32027960

57. Kim HJ, Mawla I, Lee JC, Gerber J, Walker K, Kim J, Ortiz A, Chan ST, **Loggia ML**, Wasan AD, Edwards RR, Kong J, Kaptchuk TJ, Gollub RL, Rosen BR, Napadow V. Reduced tactile acuity in chronic low back pain is linked with structural neuroplasticity in primary somatosensory cortex and is modulated by acupuncture therapy. Neuroimage. 2020 Aug 15;217:116899. doi: 10.1016/j.neuroimage.2020.116899. PMID: 32380138

58. Herranz E, Louapre C, Treaba CA, Govindarajan ST, Ouellette R, Mangeat G, **Loggia ML**, Sloane JA, Mainero C. Profiles of cortical inflammation in multiple sclerosis by 11C-PBR28 MR-PET and 7 Tesla imaging. Mult Scler. 2020 Oct;26(12):1497-1509. doi: 10.1177/1352458519867320. PMID: 31368404

59. Van Weehaeghe D, Babu S, De Vocht J, Zürcher NR, Chew S, Tseng CJ, **Loggia ML**, Koole M, Rezaei A, Schramm G, Van Damme P, Hooker JM, Van Laere K, Atassi N. Moving towards multicenter therapeutic trials in ALS: feasibility of data pooling using different TSPO positron emission tomography (PET) radioligands. J Nucl Med. 2020 Nov;61(11):1621-1627. doi: 10.2967/jnumed.119.241059. PMID: 32169920

60. #Torrado-Carvajal A, Albrecht DS, Lee JC, Andronesi OC, Ratai EM, Napadow V, **Loggia ML**. Inpainting as a technique for estimation of missing voxels in chemical shift imaging. Ann Biomed Eng. 2021 Jan;49(1):345-353. doi: 10.1007/s10439-020-02556-3. PMID: 32632531

61. Rapalino O*, #Weerasekera A*, Moum SJ, Eikermann-Haerter K, Edlow BL, Fischer D, Torrado-Carvajal A, **Loggia ML**, Mukerji S, Schaefer PW, Gonzalez RG, Lev MH, Ratai EM. Brain MR spectroscopic findings in three consecutive COVID-19 patients: preliminary observations. AJNR Am J Neuroradiol. 2021 Jan;42(1):37-41. doi: 10.3174/ajnr.A6877. PMID: 33122208

62. #Albrecht DS, Kim M, Akeju O, Torrado-Carvajal A, Edwards RR, Zhang Y, Bergan C, Protsenko E, Kucyi A, Wasan AD, Hooker JM, Napadow V, **Loggia ML**. The Neuroinflammatory component of negative affect in patients with chronic pain. Mol Psychiatry. 2021 Mar;26(3):864-874. doi: 10.1038/s41380-019-0433-1. PMID: 31138890

63. #Torrado-Carvajal A, Toschi N, Albrecht DS, Chang K, Akeju O, Kim M, Edwards RR, Zhang Y, Hooker JM, Duggento A, Kalpathy-Cramer J, Napadow V, **Loggia ML**. Thalamic neuroinflammation as a reproducible and discriminating signature for chronic low back pain. Pain. 2021 Apr 1;162(4):1241-1249. doi: 10.1097/j.pain.0000000000002108. PMID: 33065737
    - *Editor's Choice*
    - *Grünenthal Foundation Award for Pain Research 2021*

64. Zürcher NR, **Loggia ML**, Mullett JE, Tseng CE, Bhanot A, Richey L, Hightower B, Wu C, Parmar AJ, Butterfield RI, Dubois JM Chonde D, Izquierdo-Garcia D, Wey HY, Catana C, Hadjikhani N, MD, McDougle CJ, Hooker JM. [^{11}C]PBR28 PET-MR imaging reveals lower regional brain expression of translocator protein (TSPO) in young adult males with autism spectrum disorder. Mol Psychiatry. 2021 May;26(5):1659-1669. doi: 10.1038/s41380-020-0682-z. PMID: 32076115

65. Isenburg K, Mawla I, **Loggia ML**, Ellingsen DM, Protsenko E, Kowalski MH, Swensen D, O'Dwyer-Swensen D, Edwards RR, Napadow V, Kettner N. Increased Salience Network Connectivity Following Manual Therapy is Associated with Reduced Pain in Chronic Low Back Pain Patients. J Pain. 2021 May;22(5):545-555. doi: 10.1016/j.jpain.2020.11.007. PMID: 33321196.

66. #Weerasekera A, Morrissey E, Kim M, Saha A, Lin Y, Alshelh Z, Torrado-Carvajal A, Albrecht DS, Akeju O, Kwon YM, Bedair H, Chen A, Napadow V, Ratai EM, Edwards RR, **Loggia ML**. Thalamic neurometabolite alterations in patients with knee osteoarthritis before and after total knee replacement. Pain. 2021 Jul 1;162(7):2014-2023. doi: 10.1097/j.pain.0000000000002198. PMID: 33470749
    - *Editor's Choice*

67. Barowsky S, Jung JY, Nesbit N, Silberstein M, Fava M, **Loggia ML**, Smoller JW, Lee PH. Cross-Disorder Genomics Data Analysis Elucidates a Shared Genetic Basis Between Major Depression and Osteoarthritis Pain. Front Genet. 2021 Sep 16;12:687687. doi: 10.3389/fgene.2021.687687. eCollection 2021. PMID: 34603368

68. Lee J, Andronesi OC, Torrado-Carvajal A, Ratai EM, **Loggia ML**, Weerasekera A, Berry MP, Ellingsen DM, Isaro L, Lazaridou A, Paschali M, Grahl A, Wasan AD, Edwards RR, Napadow V. 3D magnetic resonance spectroscopic imaging reveals links between brain metabolites and multidimensional pain features in fibromyalgia. Eur J Pain. 2021 Oct;25(9):2050-2064. doi: 10.1002/ejp.1820. PMID: 34102707

69. Sander CY, Bovo S, Torrado-Carvajal A, Albrecht D, Deng H, Napadow V, Price JC, Hooker JM, **Loggia ML**. [^{11}C]PBR28 radiotracer kinetics are not driven by alterations in cerebral blood flow. J Cereb Blood Flow Metab. 2021 Nov;41(11):3069-3084. doi: 10.1177/0271678X211023387. PMID: 34159823

70. Keating D, Zundel CG, Abreu M, Krengel M, Aenlle K, Nichols MD, Toomey R, Chao LL, Golier J, Abdullah L, Quinn E, Heeren T, Groh JR, Koo BB, Killiany R, **Loggia ML**, Younger J, Baraniuk J, Janulewicz P, Ajama J, Quay M, Baas PW, Qiang L, Conboy L, Kokkotou E, O'Callaghan JP, Steele L, Klimas N, Sullivan K. Boston biorepository, recruitment and integrative network (BBRAIN): A resource for the Gulf War Illness scientific community. Life Sci. 2021 Nov 1;284:119903. doi: 10.1016/j.lfs.2021.119903. Epub 2021 Aug 26. PMID: 34453948

71. Schaechter JD, Hightower BG, Kim M, **Loggia ML**. A pilot [11C]PBR28 PET/MRI study of neuroinflammation and neurodegeneration in chronic stroke patients. Brain Behav Immun Health. 2021 Aug 24;17:100336. doi: 10.1016/j.bbih.2021.100336. PMID: 34589819
    - *Featured on issue cover*

72. Paschali M, Lazaridou A, Vilsmark ES, Lee J, Berry M, Grahl A, Anzolin A, **Loggia M**, Napadow V, Edwards RR. The "self" in pain: high levels of schema-enmeshment worsen fibromyalgia impact. BMC Musculoskelet Disord. 2021 Oct 12;22(1):871. doi: 10.1186/s12891-021-04740-5. PMID: 34641855

73. Cheng CH, Alshelh Z, Guan Y, Sullivan K, **Loggia ML***, Koo BB*. Association of the tissue microstructural diffusivity and translocator protein PET in Gulf War Illness. Brain Behav Immun Health. 2021 Oct 6;18:100364. doi: 10.1016/j.bbih.2021.100364. PMID: 34693367

74. Barry R, Torrado-Carvajal A, Kirsch JE, Arabasz GE, Albrecht DS, Alshelh ZA, Pijanowski O, Lewis AJ, Keegan M, Reynolds B, Knight PC, Morrissey EJ, **Loggia ML**, Atassi N, Hooker JM, Babu S. Selective atrophy of the cervical enlargement in whole spinal cord MRI of amyotrophic lateral sclerosis. Neuroimage Clin. 2022;36:103199. doi: 10.1016/j.nicl.2022.103199. PMID: 36137496

75. Sari H, Galbusera R, Bonnier G, Lin Y, Alshelh Z, Torrado-Carvajal A, Mukerji SS, Ratai EM, Gandhi RT, Chu JT, Akeju O, Orhurhu V, Salvatore AN, Sherman J, Kwon DS, Walker B, Rosen B, Price JC, Pollak LE, **Loggia ML***, Granziera C*. Multimodal Investigation of Neuroinflammation in Aviremic Patients With HIV on Antiretroviral Therapy and HIV Elite Controllers. Neurol Neuroimmunol Neuroinflamm. 2022 Feb 9;9(2):e1144. doi: 10.1212/NXI.0000000000001144. Print 2022 Mar. PMID: 35140142. Erratum in: Neurol Neuroimmunol Neuroinflamm. 2022 Jun 10;9(4): PMID: 35140142; PMCID: PMC8860468.
    - *Featured on Editorial*

76. Cheng JC, Anzolin A, Berry M, Honari H, Paschali M, Lazaridou A, Lee J, Ellingsen DM, **Loggia ML**, Grahl A, Lindquist MA, Edwards RR, Napadow V. Dynamic Functional Brain Connectivity Underlying Temporal Summation of Pain in Fibromyalgia. Arthritis Rheumatol. 2022 Apr;74(4):700-710. doi: 10.1002/art.42013. PMID: 34725971

77. Ibinson JW, Gillman AG, Schmidthorst V, Li C, Napadow V, **Loggia ML**, Wasan AD. Comparison of test-retest reliability of BOLD and pCASL fMRI in a two-center study. BMC Med Imaging. 2022 Apr 3;22(1):62. doi: 10.1186/s12880-022-00791-9. PMID: 35366813

78. #Alshelh Z, Brusaferri L, Saha A, Morrissey E, Knight P, Kim M, Zhang Y, Hooker JM, Albrecht D, Torrado-Carvajal A, Placzek MS, Akeju O, Price J, Edwards RR, Lee J, Sclocco R, Catana C, Napadow V, **Loggia ML**. Neuroimmune signatures in chronic low back pain subtypes. Brain. 2022 Apr 29;145(3):1098-1110. doi: 10.1093/brain/awab336. PMID: 34528069
    - *Pain Research Form Editor's Choice*

79. #Brusaferri L, Alshelh Z, Martins D, Kim M, Weerasekera A, Housman H, Morrissey EJ, Knight PC, Castro-Blanco KA, Albrecht DS, Tseng CE, Zürcher NR, Ratai EM, Akeju O, Makary MM, Catana C,

Mercaldo ND, Hadjikhani N, Veronese M, Turkheimer F, Rosen BR, Hooker JM, **Loggia ML**. The pandemic brain: Neuroinflammation in non-infected individuals during the COVID-19 pandemic. Brain Behav Immun. 2022 May;102:89-97. doi: 10.1016/j.bbi.2022.02.018. PMID: 35181440

- *Study featured on Editorial*

80. Martins D, Dipasquale O, Veronese M, Turkheimer F, **Loggia ML**, McMahon S, Howard MA, Williams SCR. Transcriptional and cellular signatures of cortical morphometric remodelling in chronic pain. Pain. 2022 Jun 1;163(6):e759-e773. doi: 10.1097/j.pain.0000000000002480. PMID: 34561394

81. Turkheimer FE, Liu J, Fagerholm ED, Dazzan P, **Loggia ML**, Bettelheim E. The Art of Pain: a quantitative colour analysis of the self-portraits of Frida Khalo. Front Hum Neurosci. 2022 Sep 2;16:1000656. doi: 10.3389/fnhum.2022.1000656. PMID: 36118965.

82. #Pike CK, Kim M, Schnitzer K, Mercaldo N, Edwards RR, Napadow V, Zhang Y, Morrissey EJ, Alshelh ZA, Evins EA, **Loggia ML***, Gilman JM*. Study protocol for a phase II, double-blind, randomized controlled trial of cannabidiol (CBD) compared to placebo for reduction of brain neuroinflammation in adults with chronic low back pain. BMJ Open. 2022 Sep 19;12(9):e063613. doi: 10.1136/bmjopen-2022-063613. PMID: 36123113

83. Carriere JS, Martel MO, **Loggia ML**, Campbell CM, Smith MT, Haythornthwaite JA, Edwards RR. The influence of expectancies on pain and function over time following total knee arthroplasty. Pain Med. 2022 Sep 30;23(10):1767-1776. doi: 10.1093/pm/pnac067. PMID: 35482515

84. #Zhu Y, **Loggia ML**, Edwards RR, Flowers MK, Muñoz-Vergara, Partridge AH, Schreiber KL. Increased Clinical Pain Locations and Pain Sensitivity in Women after Breast Cancer Surgery: Influence of Aromatase Inhibitor Therapy. Clin J Pain. 2022 Dec 1;38(12):721-729. doi: 10.1097/AJP.0000000000001073. PMID: 36136765

85. Bartolo ND, Reid SE, Krishnan HS, Haseki A, Renganathan M, Largent-Milnes TM, Norwood BA, **Loggia ML**, Hooker JM. Radiocaine: An Imaging Marker of Neuropathic Injury. ACS Chem Neurosci. 2022 Dec 21;13(24):3661-3667. doi: 10.1021/acschemneuro.2c00717. PMID: 36472927

86. Schaechter J, Kim M, Hightower B, Ragas T, **Loggia ML**. Disruptions in Structural and Functional Connectivity Relate to Poststroke Fatigue. Brain Connect. 2023 Feb;13(1):15-27. doi: 10.1089/brain.2022.0021. PMID: 35570655

87. #Morrissey EJ, Alshelh Z, Knight PC, Saha A, Kim M, Torrado-Carvajal A, Zhang Y, Edwards, Pike C, Locascio JJ, Napadow V. **Loggia ML**. "Assessing the Potential Anti-Neuroinflammatory Effect of Minocycline in Chronic Low Back Pain: Protocol for a randomized, double-blind, placebo-controlled trial." Contemp Clin Trials. 2023 Mar;126:107087. doi: 10.1016/j.cct.2023.107087. PMID: 36657520

88. Mauck MC, Lotz J, Psioda MA, Carey TS, Clauw DJ, Majumdar S, Marras WS, Vo N, Aylward A, Hoffmeyer A, Zheng P, Ivanova A, McCumber M, Carson C, Anstrom KJ, Bowden AE, Dalton D, Derr L, Dufour J, Fields AJ, Fritz J, Hassett AL, Harte SE, Hue TF, Krug R, **Loggia ML**, Mageswaran P, McLean SA, Mitchell UH, O'Neill C, Pedoia V, Quirk DA, Rhon DI, Rieke V, Shah L, Sowa G, Spiegel B, Wasan AD, Wey HM, LaVange L. The Back Pain Consortium (BACPAC) Research Program: Structure, Research Priorities, and Methods. Pain Med. 2023 Aug 4;24(Suppl 1):S3-S12. doi: 10.1093/pm/pnac202. PMID: 36622041

89. #Sandström A*, Torrado-Carvajal A*, Morrissey EJ, Kim M, Alshelh Z, Zhu Y, Li MD, Chang CY, Jarraya M, Akeju O, Schrepf A, Kwon Y-M, Bedair H, Chen AF, Mercaldo N, Kettner N, Napadow V, Toschi N, Edwards RR, **Loggia ML**. [^{11}C]PBR28 positron emission tomography signal as an imaging marker of

joint inflammation in knee osteoarthritis. Pain. 2023 Nov 28. doi: 10.1097/j.pain.0000000000003114. PMID: 380156220

- *Young Investigator Award to AS and ATC, ISOAI, Marrakech, Morocco, 2024*

90. Arsava EM, Chang K, Tawakol A, **Loggia ML**, Goldstein JN, Brown J, Park KY, Singhal A, Kalpathy Cramer J, Sorensen G, Rosen BR, Samuels M, Ay H. Stroke-related visceral alterations: a voxel-based neuroanatomic localization study. Ann Neurol. 2023 Dec;94(6):1155-1163. doi: 10.1002/ana.26785. PMID: 37642641

91. #Brusaferri L, Alshelh Z, Schnieders JH, Sandström A, Mohammadian M, Morrissey EJ, Kim M, Chane CA, Grmek GC, Murphy JP, Bialobrzewski J, DiPietro A, Klinke J, Zhang Y, Torrado-Carvajal A, Akeju O, Wu O, Rosen BR, Napadow V, Hadjikhani N, **Loggia ML**. Neuroimmune Activation And Increased Brain Aging In Chronic Pain Patients After The COVID-19 Pandemic Onset. Brain Behav Immun. 2023 Dec 9;116:259-266. doi: 10.1016/j.bbi.2023.12.016. PMID: 38081435

92. #Weerasekera A*, #Knight PC*, Alshelh Z, Morrissey EJ, Kim M, Zhang Y, Napadow V, Anzolin A, Torrado-Carvajal A, Edwards RR, Ratai E, **Loggia, ML**. Thalamic neurometabolite alterations in chronic low back pain: a common phenomenon across musculoskeletal pain conditions? Pain. 2024 Jan 1;165(1):126-134. doi: 10.1097/j.pain.0000000000003002. PMID: 37578456

93. Lee JC, Lazaridou A, Paschali M, **Loggia ML**, Pinzka M, Ellingsen DM, Isenburg K, Anzolin A, Grahl A, Wasan AD, Napadow V, Edwards RR. A Randomized, Controlled Neuroimaging Trial of Cognitive-Behavioral Therapy for Fibromyalgia Pain. Arthritis & Rheumatology. 2024 Jan;76(1):130-140. doi: 10.1002/art.42672. PMID: 37727908

94. Herranz E, Treaba CA, Barletta VT, Mehendiratta A, Ouellette R, Sloane JA, Ionete C, Babu S, **Loggia ML**, Makary MM, Hooker JM, Catana C, Kinkel R, Nicholas R, Klawiter EC, Magliozzi R, Mainero C. Characterization of cortico-meningeal expression translocator protein expression in multiple sclerosis. Brain. 2024 Jul 5;147(7):2566-2578. doi: 10.1093/brain/awae030. PMID: 38289855; PMCID: PMC11224595.

95. VanElzakker MB, Bues HF, Brusaferri L, Kim M, Saadi D, Ratai EM, Dougherty DD, **Loggia ML**. Neuroinflammation in post-acute sequelae of COVID-19 (PASC) as assessed by [11C]PBR28 PET correlates with vascular disease measures. Brain Behav Immun. 2024 Jul;119:713-723. doi: 10.1016/j.bbi.2024.04.015. Epub 2024 Apr 18. PMID: 38642615; PMCID: PMC11225883.

96. Yoo CH, Rani N, Shen S, **Loggia ML**, Gaynor K, Moore KE, Bagdasarian FA, Lin YS, Edwards RR, Price JC, Hooker JM, Wey HY. Investigating Neuroepigenetic Alterations in Chronic Low Back Pain with Positron Emission Tomography. Pain. 2024 May 21. doi: 10.1097/j.pain.0000000000003272. Epub ahead of print. PMID: 38776171.

97. Shraim MA, Massé-Alarie H, Farrell MJ, Cavaleri R, **Loggia ML,** Hodges PW. Neuroinflammatory activation in sensory and motor regions of the cortex is related to sensorimotor function in individuals with low back pain maintained by nociplastic mechanisms: a preliminary proof-of-concept study. Eur J Pain. 2024 Jul 15. doi: 10.1002/ejp.2313. Epub ahead of print. PMID: 39007713.

98. #Maccioni L, Carranza Mellana M, Brusaferri L, Silvestri E, Bertoldo A, Schubert JJ, Nettis MA, Mondelli V, Howes O, Turkheimer FE, Bottlaender M, Bodini B, Stankoff B, **Loggia ML**, Veronese M. A blood-free modelling approach for the quantification of the blood-to-brain tracer exchange in TSPO PET imaging. Front Neurosci. 2024 Jul 22;18:1395769. doi: 10.3389/fnins.2024.1395769. PMID: 39104610; PMCID: PMC11299498.

99. #Ferrante M*, Inglese M*, Brusaferri L, Whitehead A, Maccioni L, Veronese M, **Loggia ML**, Toschi N. Physically Informed Neural Network for Metabolite-Corrected Plasma Input Function Estimation In Dynamic PET Imaging. Comput Methods Programs Biomed. 2024 Aug 20;256:108375. doi: 10.1016/j.cmpb.2024.108375. Epub ahead of print. PMID: 39180914.

100. Cazuza RA, Zagrai SM, Grieco AR, Avery TD, Abell AD, Wey HY, **Loggia ML**, Grace PM. 18 kDa Translocator protein (TSPO) is upregulated in rat brain after peripheral nerve injury and downregulated by diroximel fumarate. Brain Behavior Immunity (accepted).

101. Treaba CA, Herranz E, Barletta BT, Mehndiratta A, Sloan JA, Granberg T, **Loggia ML,** Mainero C. Phenotyping of chronic inflammation in vivo in multiple sclerosis by combined ^{11}CPBR28 PET and 7T susceptibility-weighted imaging. Multiple Sclerosis Journal (accepted).

102. Eiff B, Bullmore ET, Clatworthy MR, Fryer TD, Pariante CM, Mondelli V, Maccioni L, **Loggia ML**, Moskowitz MA, Bruner E, Veronese M, Turkheimer FE, NIMA Consortium, Julia J Schubert. Extra-axial inflammatory signal and its relation to peripheral and central immunity in depression. Brain (accepted)

103. #Mohammadian M, Morrissey EJ, Knight PC, Brusaferri L, Kim M, Efthimiou N, Murphy, Alshelh. Z, Grmek G, Schnieders JH, Chane CA, Sandström A, Catana C, Gilman J, Locascio JJ, Edwards RR, Edwards RR, Zhang Y, Napadow V. **Loggia ML**. Investigating the potential of minocycline in reducing brain inflammation in chronic low back pain: a randomized, placebo-controlled, mechanistic clinical trial. PAIN (accepted).

104. #Tohyama S*****, #Datko M*****, Brusaferri L*****, Kinder LD, Schnieders JH, Hyman M, Goldstein AM, Gilbert MD, Housman H, Le V, Round K, Marin F, Garcia RG, Gollub RL, Edwards RR, Rosen BR, Hadjikhani N, Cheng HT, Schuman-Olivier Z, **Loggia ML***, Napadow V*. Trigeminal nerve microstructure is linked with neuroinflammation and brainstem response in migraine. Brain (accepted).

Other peer-reviewed scholarship

1. Quidé Y, Jahanshad N, Andoh J, Antoniou G, Apkarian AV, Ashar Y, Badran B, Baird CL, Baxter L, Bell TR, Blanco-Hinojo L, Borckardt J, Cheung CL, Ciampi de Andrade D, Couto BA, Cox SR, Cruz-Almeida Y, Dannlowski U, De Martino E, de Tommaso M, Deus J, Domin M, Egorova-Brumley N, Elliott J, Fanton S, Fauchon C, Flor H, Franz CE, Gatt J, Gerdhem P, Gilman J, Gollub R, Govind V, Graven-Nielsen T, Håkansson G, Hales T, Haswell C, Heukamp NJ, Hu L, Huang L, Hussain A, Jensen K, Kircher T, Kremen WS, Leehr EJ, Lindquist M, **Loggia ML**, Lotze M, Martucci KT, Meeker TJ, Meinert S, Millard SK, Morey RA, Murillo Ezcurra C, Nees F, Nenadic I, Park HRP, Peng X, Ploner M, Pujol J, Robayo LE, Salan T, Seminowicz D, Serian A, Slater R, Stein F, Stevens J, Strauss S, Sun D, Vachon-Presseau E, Valdes-Hernandez P, Vanneste S, Vernon M, Verriotis M, Wager T, Widerstrom-Noga E, Woodbury A, Zeidan F, Bhatt RR, Ching CRK, Thomopoulos SI, Thompson PM, Gustin SM. ENIGMA-Chronic Pain: a worldwide initiative to identify brain correlates of chronic pain. Pain (accepted).

Scholarship without named authorship

1. Martins D, Giacomel A, Williams SCR, Turkheimer F, Dipasquale O, Veronese M; **PET Templates Working Group***. (2021). Imaging transcriptomics: Convergent cellular, transcriptomic, and molecular neuroimaging signatures in the healthy adult human brain. Cell Rep. 2021 Dec 28;37(13):110173. doi: 10.1016/j.celrep.2021.110173. PMID: 34965413. *(*member of the writing*

group cited in the appendix of the manuscript)

2. Qu, J. Z., Mueller, A., McKay, T. B., Westover, M. B., Shelton, K. T., Shaefi, S., D'Alessandro, D. A., Berra, L., Brown, E. N., Houle, T. T., Akeju, O., & **MINDDS Study Team***. (2022). Nighttime dexmedetomidine for delirium prevention in non-mechanically ventilated patients after cardiac surgery (MINDDS): A single-centre, parallel-arm, randomised, placebo-controlled superiority trial. EClinicalMedicine, 56, 101796. https://doi.org/10.1016/j.eclinm.2022.101796. PMID: 36590787 *(*member of the writing group cited in the appendix of the manuscript)*

Non-Peer Reviewed scientific or medical scholarship/materials in print or other media

Proceedings of meetings or other non-peer reviewed scholarship

1. Kodituwakku, Kim J, Napadow V, **Loggia ML**, Barbieri R. Point Process Respiratory Sinus Arrhythmia Analysis during Deep Tissue Pain Stimulation. Comput Cardiol (2011). Conference Publication.

2. Sclocco R, **Loggia ML**, Garcia RG, Edwards RR, Kim J, Cerutti S, Bianchi AM, Napadow V, Barbieri R. Nonlinear relationship between perception of deep pain and medial prefrontal cortex response is related to sympathovagal balance. XIII Mediterranean Conference on Medical and Biological Engineering and Computing (2013). Conference Publication.

3. Ferrante M, Inglese M, Brusaferri L, Whitehead A, **Loggia ML**, Toschi N. Physically Informed Neural Network for Non-Invasive Arterial Input Function Estimation In Dynamic PET Imaging. Medical Imaging with Deep Learning 2022.

Reviews, chapters, monographs and editorials

1. **Loggia ML**, Schweinhardt P, Villemure C, Bushnell MC. Effects of psychological state on pain perception in the dental environment. J Can Dent Assoc. 2008 Sep;74(7):651-6. PMID: 18789200. Review

2. Schweinhardt P, **Loggia ML**, Villemure C, Bushnell MC. Psychological state and pain perception. In: Sessle BJ, Lavigne GJ, Lund JP and Dubner R, editors. *Orofacial Pain and Related Conditions*, 2nd Edition, 2008. Chicago: Quintessence. Chapter

3. **Loggia ML** and Jensen KB. Imaging Pain in the Human Brain. In: Seeman P, Madras BK and Johnson JE, *Imaging of the Human Brain in Health and Disease* (2013). Oxford: Academic Press. Chapter

4. Jensen KB, Berna C, **Loggia ML**, Wasan AD, Gollub RL, Edwards RR. The use of functional neuroimaging to evaluate psychological and other non-pharmacological treatments for clinical pain. Neurosci Lett. 2012 Jun 29;520(2):156-64. doi: 10.1016/j.neulet.2012.03.010. PMID: 22445888. Review

5. **Loggia ML**, Napadow V. Multi-parameter autonomic-based pain assessment: more is more? Pain. 2012 Sep;153(9):1779-1780. doi: 10.1016/j.pain.2012.05.010. PMID: 22633682. Commentary

6. Lai TH, Protsenko E, Cheng YC, **Loggia ML**, Coppola G, Chen WT. Neural plasticity in migraine and other headaches. Neural Plast. 2015;2015:205985. doi: 10.1155/2015/205985. PMID: 26366304. Review

7. Albrecht DS, Granziera C, Hooker JM, **Loggia ML**. In vivo imaging of human neuroinflammation. ACS Chemical Neuroscience. ACS Chem Neurosci. 2016 Apr 20;7(4):470-83. doi: 10.1021/acschemneuro.6b00056. PMID: 26985861. Review. Erratum in: ACS Chem Neurosci. 2018 Jun 20;9(6):1515. doi: 10.1021/acschemneuro.8b00188. PMID: 29708334

8. Nijs J, **Loggia ML**, Polli A, Moens M, Huysmans E, Goudman L, Meeus M, Vanderweeën, Ickmans K, Clauw DJ. Sleep disturbances and severe stress as glial activators: key targets for treating central sensitization in chronic pain patients? Expert Opin Ther Targets. 2017 Aug;21(8):817-826. doi: 10.1080/14728222.2017.1353603. PMID: 28685641. Review

9. Lee YC, Napadow V, **Loggia ML**. Functional connectivity: dissecting the relationship between the brain and ”pain centralization” in rheumatoid arthritis. Arthritis Rheumatol. 2018 Jul;70(7):977-980. doi: 10.1002/art.40454. PMID: 29761844. Commentary

10. **Loggia ML**. Chronic pain and opioid receptor availability: disentangling the molecular contributions and the “chicken or the egg” dilemma. Pain. 2018 Sep;159(9):1679-1680. doi: 10.1097/j.pain.0000000000001283. PMID: 29794615. Commentary

11. **Loggia ML** and Edwards RR. Brain structural alterations in chronic knee osteoarthritis: what can treatment effects teach us? Pain Med. 2018 Nov 1;19(11):2099-2100. doi: 10.1093/pm/pny165. PMID: 30137638. Commentary

12. Hodges PW, Barbe MF, **Loggia ML**, Nijs J, Stone LS. Diverse impact of biological plasticity and sensorimotor control of the spine in low back pain. J Orthop Sports Phys Ther. 2019 Jun;49(6):389-401. doi: 10.2519/jospt.2019.8716. PMID: 31151376. Review

13. **Loggia ML***, Segerdahl AR*, Howard MA, Tracey I. Imaging clinically relevant pain states using arterial spin labeling. **Loggia ML**, Segerdahl AR, Howard MA, Tracey I. Pain Rep. 2019 May 15;4(4):e750. doi: 10.1097/PR9.0000000000000750. PMID: 31406952. Review

14. Grace PM, Tawfik VL, Svensson CI, Burton MD, **Loggia ML**, Hutchinson MR. The neuroimmunology of chronic pain: from rodents to humans. J Neurosci. 2021 Feb 3;41(5):855-865. doi: 10.1523/JNEUROSCI.1650-20.2020. PMID: 33239404. Review

15. **Loggia ML**. “Neuroinflammation”: does it have a role in human chronic pain? Evidence from human imaging. Pain (accepted). Review.

Letters to the Editor

1. **Loggia ML**, Edwards RR, Harris RE, Napadow V. Reply to JH Lampman: “What is the proper control group for a fibromyalgia study?”. Arthritis Rheumatol. 2014 Jun;66(6):1684-5. doi: 10.1002/art.38396. PMID: 24515749

2. Herranz E, Hooker JM, Izquierdo-Garcia D, **Loggia ML**, Mainero C. ^{11}C-PBR28 increase in multiple sclerosis reflects neuroinflammation. Anesthesiology. 2017 Mar;126(3):419-430. doi: 10.1097/ALN.0000000000001509. PMID: 28092321

Thesis

Loggia ML. Attentional, emotional and psychosocial influences on pain: psychophysics and neuroanatomical correlates. McGill University 2008.

Manuscripts submitted to preprint servers

NA

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

Selection (Special recognition, and/or last three years and not yet published as full-length manuscripts)
#Presenter

1. **Loggia ML**, Mohammed NK, Mogil JS, #Bushnell MC. Empathy: does it influence pain perception? Soc Neurosci Abst (2005), Washington, DC.
   Selected for press conference

2. #**Loggia ML**, Kim J, Kong J, Gollub RL, Napadow V, Wasan AD. Chronic low back pain patients (CLBP) display altered brain connectivity in the Default Mode Network – An Arterial Spin Labeling (ASL) MRI Study. American Academy of Pain Medicine (2012), Palm Springs, CA.
   Best Abstract, selected for Plenary Session oral presentation

3. #Atassi N, Lawson R, McCarthy P, Sawicki D, Berry J, **Loggia ML**, Catana C, Hooker JM, Cudkowicz M. Microglial activation in people with amyotrophic lateral sclerosis. 10th Annual Clinical Research Day, MGH, Boston MA.
   Best Abstract Award (Neurology)

4. #Hadjikhani N, Mainero C, Ward N, **Loggia ML**, Anderson T, Zurcher N, Arabasz G, Catana C, Hooker JM. PET/MRI evidence of neuroinflammation in migraine. 67th Annual Meeting of the MGH Scientific Advisory Committee (SAC)
   Poster of Distinction Award

5. Housman H*, #Brusaferri L*, Datko M, Tohyama S, Round K, Garcia Gomez RG, Gollub RL, Edwards RR, Makary M, Rosen BR, Cheng HT, Schuman-Olivier Z, Napadow V, Hadjikhani N, **Loggia ML**. In vivo molecular imaging of neuroinflammation in patients with migraine. Conference of the US Association for the Study of Pain 2022, Cincinnati, OH.

6. #Datko M, Schuman-Olivier Z, Brusaferri L, Housman H, Tohyama S, Round K, Garcia R, Gollub RL, Edwards RR, Rosen BR, Hadjikhani N, Cheng H, **Loggia ML** and Napadow V. Insula response to interoception is inversely correlated with trait mindfulness, self-compassion, and migraine frequency in patients with episodic migraine. Conference of the US Association for the Study of Pain 2022 Cincinnati, OH.

7. #Brusaferri L, Housman H, Datko M, Tohyama S, Round K, Le V, Ward NC, Garcia RG, Gollub RL, Edwards RR, Rosen BR, Cheng HT, Schuman-Olivier Z, Napadow V, Hadjikhani N, **Loggia ML**. Migraine and neuroinflammation: a [^{11}C]PBR28 PET-MR study. IASP World Congress on Pain (22), Toronto CA.

8. #Alshelh Z, Morrissey E, Knight P, Torrado-Carvajal A, Kim M, Akeju O, Saha A, Lin Y, Kwon YM, Bedair H, Chen AF, Napadow V, Edwards RR, **Loggia ML**. Neuroinflammation in Knee Osteoarthritis and Effects of Total Knee Arthroplasty. 19th World Congress on Pain (2022). Toronto, Canada.

9. #Ferrante M, Inglese M, Brusaferri L, **Loggia ML**, Toschi N. TSPO PET synthesis from T1-weighted MRI images through deep learning for chronc pain patients. OHBM (2023). Montreal, QC, Canada.

10. #Zhu Y, Schreiber K, **Loggia ML**, Haythornthwaite J, Campbell C, Smith M, Edwards R. Sex differences in pain, sensory function and psychosocial factors among knee osteoarthritis patients. USASP (2023). Durham, UC, US.

11. #Sandström A, Kim M, Weerasekera A, Castro-Blanco K, Lin Y, Alshelh Z, Torrado-Carvajal A, Mukerji SS, Gandhi RT, Chu J, Pollak L, Napadow V, Edwards RR, Ratai EM, **Loggia ML**. ^{1}H-MRS Brain Metabolites and Quantitative Sensory Testing in People Living With HIV and HIV-Related Neuropathic Pain. USASP (2023). Durham, UC, US.

12. #Ferrante M, Inglese M, Brusaferri L, **Loggia ML**, Nicola Toschi. TSPO PET synthesis from T1-weighted MRI images through deep learning. 36th annual congress of the European Association of Nuclear Medicine (2023). Vienna, Austria.

13. #Fu JL, Tseng CE, Makary MM, Zhu J, Gifford R, Rutherford H, Gelevski D, Lewis A, Chin C, Sanders D, Arabasz G, Hsu S, Catana C, van Weehaeghe D, Hooker J, Paganoni S, Zurcher N, **Loggia ML**, Atassi N, Price J, Babu S. Longitudinal assessment of neuroinflammatory changes in amyotrophic lateral sclerosis using [11C]PBR28 PET. Neuroreceptor mapping (NRM) (2024). Montreal, Canada.

14. #Kim M, Sandström A, Tandon A, Weerasekera A, Castro-Blanco K, Mukerji SS, Napadow V, Edwards RR, Ratai EM, **Loggia ML**. Neuroinflammation in Human Immunodeficiency Virus-Related Neuropathic Pain. Organization for Human Brain Mapping Annual Meeting (2024), Seoul, Korea.

15. #Kim M, Sandström A, Tandon A, Weerasekera A, Castro-Blanco K, Mukerji SS, Napadow V, Edwards RR, Ratai EM, **Loggia ML**. Neuroinflammation in Human Immunodeficiency Virus-Related Neuropathic Pain. IASP World Congress on Pain (2024). Amsterdam, The Netherlands.

16. #Klinke J, Mohammadian M, Morrissey EJ, Kim M, Alshelh Z, Brusaferri L, Torrado-Carvajal A, Grmek G, Chane C, Murphy J, Kwon YM, Bedair H, Siliski J, Chen AF, Melnic C, Edwards RR, Napadow V, **Loggia ML**. Do Patients with Knee Osteoarthritis exhibit brain plasticity? A PET/MRI investigation. IASP World Congress on Pain (2024). Amsterdam, The Netherlands.

17. #Kim M, Sandström A, Tandon A, Weerasekera A, Castro-Blanco K, Mukerji SS, Napadow V, Edwards RR, Ratai EM, **Loggia ML**. Neuro-glial Dysfunction in Human Immunodeficiency Virus-Related Neuropathic Pain. IASP World Congress on Pain (2024). Amsterdam, The Netherlands.

18. #Datko M, Tohyama S, Schnieders JH, Brusaferri L, Kinder LD, Round K, Goldstein A, Gilbert M, Hyman M, Marin F, Goodman H, Giachos D, Garcia RG, Gollub RL, Cheng HT, Hadjikhani N, **Loggia ML**, Schuman-Olivier Z, Rosen BR, Edwards RR, Ratai E, Napadow V. Elevated Insula Glutamate in Migraine is Linked with Longer Headache Duration: A 7T H-MRS Study. IASP World Congress on Pain (2024). Amsterdam, The Netherlands.

19. #Brusaferri L, Schnieders JH, Tohyama S, Datko M, Kinder LD, Round K, Heffernan M, Garcia RG, Gollub RL, Edwards RR, Cheng HT, Schuman-Olivier Z, Rosen BR, Napadow V, Hadjikhani N,

Loggia ML. Exploring Heterogeneity in Episodic Migraine Pathophysiology with [11C]PBR28 Imaging. IASP World Congress on Pain (2024). Amsterdam, The Netherlands.

20. #Fisher H, Turco I, Brusaferri L, Prokopiou PC, Engels-Dominguez N, Qu J, Jacobs HIL, **Loggia ML**, Akeju O, Lewis LD. Dexmedetomidine sedation enhances pulsatile cerebrospinal fluid inflow in the fourth ventricle: evidence from a 7T fMRI study in humans. Lund Glymphatics Symposium (2024). Lund, Sweden.

21. Luo E, Murphy J, Kim M, Cooper-Hohn J, Mohammadian M, Axelrod A, Pike C, Gilman J*, **Loggia ML***. Neuroinflammation in the Primary Somatosensory Area is Associated with Pain Widespreadness in Individuals with Chronic Low Back Pain. USASP Meeting (2025). Chicago, IL.

22. Kim M, Luo E, Murphy JP, Byrne KC, Castro-Blanco KA, Tandon A, Weerasekera A, Sandström SA, Brusafarri L, Alshelh Z, Mukerji SS, Napadow V, Ratai E-M, **Loggia ML**. Neuroinflammation and Self-Reported Pain Widespreadness in People with Human Immunodeficiency Virus-Related Neuropathic Pain. USASP Meeting (2025). Chicago, IL.

23. Zhu Y, Weerasekera A, Mercaldo ND, Napadow V, Kim M, Morrissey EJ, Edwards RR, Schreiber KL, Ratai EM, **Loggia ML**. A Longitudinal 1H-Magnetic Resonance Spectroscopy Study of Thalamic Neurometabolite Alterations in Knee Osteoarthritis Patients One Year Post-Total Knee Arthroplasty. The United States Association for the Study of Pain (USASP) Annual Scientific Meeting (2025). April, Chicago, IL, United States.

24. Zhu Y, Swanson N, Mohammadian M, Murphy J, Kim M, Partridge AH, Mammer M, Edwards RR, Schreiber KL, **Loggia ML**. Elevated Neuroinflammation in Women with Breast Cancer: Initial Insights from [11C]PBR28 PET/MR Imaging. The American Association for Cancer Research (AACR) Annual Meeting (2025), April, Chicago, IL.

25. Schnieders JH, Datko M, Brusaferri L, Tohyama S, Round K, Kinder LD, Heffernan MR, Garcia RG, Hirschtick RL, Ratai EM, Edwards RR, Rosen BR, Cheng HT, Schuman-Olivier Z, Napadow V, Hadjikhani N, **Loggia ML**. Elevated Fractional Amplitude of Low Frequency Fluctuation Associations with Episodic Migraine Symptomatology. USASP Meeting (2025). Chicago, IL.

26. Fanton S, Grmek G, Wargo MA, Swanson N, Kim M, Eberlin K, Seyedsadjadi R, Napadow V, **Loggia ML**. Preliminary evidence of reduced neuroinflammation following medial nerve release surgery in two patients with carpal tunnel syndrome. USASP Meeting (2025). Chicago, IL.

Narrative Report

I am a brain imaging neuroscientist who specializes in the study of human chronic pain and other disorders. My laboratory, a hub of innovative research at the forefront of pain neuroscience, is driven by three core objectives: 1) understanding chronic pain; 2) biomarker identification; 3) paving the way to novel treatments. To pursue these aims, my laboratory uses an array of imaging technologies including positron emission tomography, various magnetic resonance imaging techniques (blood oxygen level dependent functional MRI, arterial spin labeling, magnetic resonance spectroscopy, diffusion MRI, and others), as well as behavioral methods (e.g., quantitative sensory testing). Notably, our work has garnered over $20M in grants from multiple NIH institutes, the Department of Defense and various foundations. In 2022, I was recognized among the top 25 “New Award Leaders” (i.e., 25 investigators with most funding in new awards) at MGH, the largest hospital-based research enterprise in the United States. Moreover, I proudly serve as Section Editor for *PAIN* (the top journal in pain research), and am

also a member of the Editorial Board for the Journal of Pain and Pain Medicine. Between 2022 and 2024 I have also served as Specialty Chief Editor for Frontiers in Pain Research. These roles underscore my commitment to advancing pain research globally.

Area of Excellence: Investigation

A major theme of my work focuses on identifying brain correlates of clinical pain, a critical step toward developing an objective biomarker for pain. To this end, we pioneered the use of an MRI technique called arterial spin labeling (ASL) in chronic pain research. In the first published study applying this method in a group of chronic pain patients (Wasan* and Loggia* et al., Anesthesiology 2011), we showcased the potential of ASL in detecting neural correlates of clinical pain in patients with chronic back pain. In a subsequent publication (Loggia et al., Pain 2013), we further showed for the first time that ASL data can be used to identify specific pattern of "functional connectivity" between brain areas and/or networks, correlating with the severity of both spontaneous back pain, and its experimental exacerbation. As of January 2024, these two papers have accrued more than 85 and 200 citations, respectively (source: Web of Science). Although the application of ASL to the study of pain is still in its infancy, this technique has already demonstrated to be a valuable tool, with more and more users employing it around the world (Loggia et al., Pain Reports 2019).

In recent years, my research has primarily focused on another significant topic: the role of neuroinflammation in human pain. Evidence from animal models strongly suggests that neuroinflammation, such as the activation of glial cells in the central nervous system, is crucial in the development and persistence of chronic pain. However, the involvement of glial cells in human pain disorders is not well understood. Using the novel technology of integrated (i.e., simultaneous) positron emission tomography-magnetic resonance imaging and the recently-developed radioligand [^{11}C]PBR28, my laboratory provided the first demonstration that a chronic pain disorder is associated with activation of glial cells in the brain (Loggia et al., Brain 2015). This work received significant attention from both the scientific community, industry, funding agencies and the media. In July 2017, our study was highlighted by the journal Brain as the most cited article for 2015-2016, accumulating over 300 citations by January 2024. It is also recognized as a "Highly Cited Paper", placing it in the top 1% of publications within the field of Neuroscience & Behavior, according to the Web of Science rankings.

Following this work, our laboratory has successfully replicated our original observation in an independent cohort of back pain patients (Torrado-Carvajal et al. Pain, 2021), providing an all-important confirmation of the reliability of the observed phenomenon. Subsequently, we have demonstrated that elevated [^{11}C]PBR28 PET signal can be observed also in the spinal cord of patients with chronic back and leg pain (Albrecht et al., Pain 2018) as well as in the brain of many other conditions, including fibromyalgia (Albrecht et al., Brain Behavior and Immunity 2019), migraine (Albrecht et al., Neurology 2019), and Gulf War Illness (Alshelh et al., Brain Behav Immunity, 2020). Furthermore, we found the [^{11}C]PBR28 PET signal to be proportional to various measures of clinical severity, such as the degree of 'nociplastic pain' (Alshelh et al., Brain 2022), the frequency of migraine attacks (Albrecht et al., Neurology 2019), or the severity of depressive symptoms (Albrecht et al., Molecular Psych 2021). Altogether, these observations suggest that neuroinflammation is likely a widespread and clinically relevant phenomenon, observable across a diverse array of human pain disorders with varied etiologies. Currently, we are conducting several NIH-funded randomized clinical trials to test whether neuroinflammation is a viable therapeutic target for pain condition. These trials are exploring a range of interventions, including pharmacological options like minocycline and cannabidiol, as well as non-pharmacological neuromodulatory methods such as transcutaneous vagus nerve stimulation, alongside psychological approaches like mindfulness-based stress reduction programs.

Beyond our central nervous system-focused studies, my laboratory has capitalized on the versatility of the [^{11}C]PBR28 PET signal to show that it can also serve as a marker for peripheral inflammation. Indeed, we have demonstrated that pain-related [^{11}C]PBR28 signal elevations can be observed also in the neuroforamina in patients with sciatica (Albrecht et al., Pain 2018) and in the knee joints in patients with knee osteoarthritis (Sändstrom and Torrado-Carvajal et al., Pain 2023). This work

suggests that the same imaging technique can be employed to detect inflammatory signals both centrally and peripherally, broadening the scope and applicability of our imaging methods.

This line of work has led to several awards and honors, including an Early Career Award (2013) and the Ulf Lindblom Young Investigator Award for Clinical Science (2016), both from the International Association for the Study of Pain, as well as multiple federal and foundation grants. In recognition of the significance of this work, I have been honored with invitations to deliver prestigious talks, including Plenary Lectures at the 2024 World Congress on Pain—the premier meeting in the pain field, where my lecture was attended by an estimated 2,500–3,000 participants—the 2025 Congress of the European Pain Federation, the 2025 Conference of the Spanish Pain Society, and several other esteemed conferences.

My scientific contributions extend to various disciplines beyond pain research. In July 2017, I participated in a key meeting convened by NIH Director Dr. Francis Collins, alongside about 35 leading figures in neuroscience and the pharmaceutical industry, including Dr. Collins, NIH institute directors, a Nobel laureate, and other eminent scientists. This meeting focused on developing strategies to address the U.S. opioid crisis. Additionally, my research group is recognized as a pivotal resource for studies exploring neuroinflammation's role in diverse conditions like ALS, multiple sclerosis, migraine, and Huntington's disease. My collaborative efforts span globally, evident in publications with the Karolinska Institutet, King's College London, among the others, and a recently awarded grant co-PIed with investigators at the University of Haifa, Israel.

Teaching

While most of my efforts are currently directed towards experimental investigation, I am also delighted to have the opportunity to teach and mentor others, an activity that I consider of primary importance for my professional and personal growth. My laboratory attracts top talents both nationally and internationally, and is currently composed of approximately 15-20 members, including multiple post-doctoral fellows, research assistants, and interns, all of whom I actively mentor via frequent one-on-one and/or group meetings. Furthermore, as co-Director of the Center for integrative Pain Neuroimaging (CiPNI), which encompasses both MGH and Spaulding Rehabilitation Network research laboratories, I have the pleasure to mentor additional trainees, including junior faculty, and to further facilitate research projects across institutions.

I enjoy teaching also in the context of seminars or graduate courses, and since 2013 I have been teaching faculty for a brain imaging course taught at the Harvard-MIT Division of Health Science and Technology (HST583). I have also been invited to give lectures about pain imaging at Harvard University (MCB148), Harvard Extension School, the Martinos Center 2-week multimodal course, the North American Pain School (Montebello, Quebec). Additionally, I have also given departmental seminars on human neuroanatomy. One of my neuroanatomy talks has been posted on Youtube, where it has received over 100,000 views.

In summary, my record demonstrates accomplishments in the field of human brain imaging, with a specific focus on unraveling the complexities of chronic pain physiology. Beyond research, I am a dedicated mentor and educator, fully invested in raising the next generation of brain and pain scientists. It is my hope that my work will meaningfully contribute to our ability to understand, diagnose, and treat pain disorders.