Current Position

Senior Lecturer
CICS, Neuroscience, BSMS, Brighton, UK
Associate Professor, Biomedical Engineering
Director, Integrated NeuroImaging Lab
Lead, PhD Program, College of Engineering
RIT, New York, USA

Education and Training

Postdoctoral Fellow	Columbia University, New York, USA	2002 - 2005
Ph.D. Bioengineering	University of Washington, Seattle, USA	1997 - 2002
M.Sc. Bioengineering	University of Washington, Seattle, USA	1993 - 1996
Research Scientist	Fred Hutch. Cancer Research Center, Seattle, USA	1992 - 1993
B.Sc. Theoretical Physics	University of Tirana, Tirana, Albania	1988 - 1992

Academic Positions

Senior Lecturer	CISC, Neuroscience BSMS, Brighton, UK	2021 - now
Research MR Physicist	CISC, Neuroscience, BSMS, Brighton, UK	2018 - 2021
Associate Professor	Biomedical Engineering, RIT, New York, USA	2013 - 2018
Assistant Professor	Biomedical Engineering, RIT, New York, USA	2013 - 2018
Adjunct Professor	Brain Research Center, U. of Rochester, USA	2013 - now
Visiting Professor	Psychology, Yale University, CT, USA	2012 - now
Visiting Scientist	Leiden University Medical Center, Netherlands	2014 - 2018
Assistant Professor	Radiology, Columbia University, New York, USA	2008 - 2013
Research Scientist	Radiology, Columbia University, New York, USA	2005 - 2008
Postdoctoral Fellow	Radiology, Columbia University, New York, USA	2002 - 2005
Associate Director/Education	Peace Corps, Tirana, Albania	1991 - 1992
Instructor of Physics	Theoretical Physics, U. of Tirana, Albania	1991 - 1992

Leadership and Community Activities

Lead, PhD Program in Healthcare Engineering, College of Engineering
Faculty Advisor, Engineering World Health (EWH)
Committee Member, 'Ethics across the curriculum'
Faculty Lead, Master's in 'Science and Public Policy'
Faculty Advisor, STEP Academy (educating high school students from unprivileged areas)

Awards and Honors

Fulbright scholarship, Bureau of Educational and Cultural Affairs, USA (1992 – 1996)
Excellence in Teaching Award, The Princeton Review, USA (2003)
Travel award, Philips NeuroNetwork, Antwerp, Belgium (2005)
Provost Innovative Learning Award, Rochester Institute of Technology (2015)
Dean's outstanding achievement award for externally disseminate scholarship, RIT (2016, 2017)
Dean's outstanding achievement award for research and training, RIT (2017)

Professional activities

Postdoctoral Supervision: **(5)**
PhD Thesis Supervision: **(4)**
PhD Thesis Committee Member: **(8)**
Undergraduate Supervision in Research (in the last 3 years): **(13)**
Senior Design Supervision **(2)**

IRIS ASLLANI   RESEARCH STATEMENT

My research goals come under the umbrella of **development of multi-modal neuroimaging techniques that combine MRI with non-MRI based methods, such as Near Infrared Spectroscopic Imaging and transcranial direct current stimulation (tDCS), for quantitative, dynamic, and multi-parametric assessment of brain function and metabolism in health and disease.**

Strategically, to achieve these goals, the work is being done on two overlapping fronts: Clinical Applications and Method Development. From a clinical perspective, the focus is on increasing the applicability of metabolic MRI in disease. From a methodological perspective, the effort is geared toward more engineering projects that combine MRI with non-MRI modalities for metabolic imaging of the brain.

Research Highlights (also in the Application form)
▸ Developed a method that corrects for partial volume effects ASL MRI. The method has spurred a new area of research with several groups, including the team at Oxford University, working on optimization and validation for clinical applications. The method was assigned a dedicated session during a recent European COST Action "ASL in Dementia" meeting. I am currently working with a PhD Neuroscience student in BSMS in adapting the PVE method for ^{23}Na MRI. We are in the process of submitting a paper to MRM.
▸ The first to show effect of tDCS on in vivo brain ^{23}Na MR images. This work has also been done at CISC and will be presented at the upcoming ISMRM meeting. A publication is in preparation.
▸ Combined ASL with covariate analysis to establish a CBF pattern that distinguishes Alzheimer's patients from healthy controls with high sensitivity and specificity. Ours was the first group to show whole-brain perfusion connectivity changes in Alzheimer's. Currently connecting with researchers on the BSMS campus as well as at the University of Nottingham to optimize this method and widen its applicability to other low SNR methods.
▸ Developed a faster and more robust method for simultaneous measurement of blood dynamics and baseline flow using ASL MRI. While this method never really picked up in the field, there has been a renewed interest in it as it may prove useful in measuring dynamics of the recently discovered glymphatic system in the brain.
▸ Built a proof-of-concept wireless EEG cap that is MRI-compatible.
▸ Constructed a 3D-printed patient specific brain phantom for applications in image quality control and clinical testing. This work has been split between CISC and RIT. The goal is to write a grant proposal that will support these efforts.

(* corresponding author)

In journal review:

- J. Petr, J. Liao, D. Bruening, S. Schmidt, M. J. P. van Osch, **I. Asllani***, High Resolution Arterial Spin Labeling fMRI at 3T: to PVEc or not to PVEc?, *NeuroImage*.
- M. A. Chappell, , X. Golay, M. Günther, J. A. Hernández-Tamames, M. J. P. van Osch, **I. Asllani,** Partial Volume Correction in Arterial Spin Labeling Perfusion MRI: A unique insight into physiology or an analysis step too far? *NeuroImage*.
- E. Holtz, M. Potter, **I. Asllani***, Design and proof of principle of a wireless EEG monitor for simultaneous MRI measurement, EMBC *IEEE conference paper*.

Published:

- H.J. Mutsaerts, J. Petr, ..., **I. Asllani**, F. Barkhof, Explore ASL: An image processing pipeline for multi-center ASL perfusion studies, *NeuroImage*, 2020
- H. J. Mutsaerts, J. Petr, R.P. Bokkers, R. Lazar, R. Marshall, **I.Asllani***, Spatial Coefficient of Variation of Arterial Spin Labeling MRI as a cerebrovascular correlate of *PLoS One*, 2020
- R.S. Marshall, M.A. Pavol, Y.K. Cheung, **I. Asllani**, R. Lazar, Cognitive impairment correlates linearly with mean flow velocity by Transcranial Doppler below a definable threshold, *Cerebrovasc. Dis*, 2020.
- S.R. de Rooij, HJ Mutsaerts, J Petr, **I. Asllani,** M.W.A. Caan, P. Groot, A.J. Nederveen, T.J. Rosebum, *Neurobiol. Aging*, 2019
- J. Petr, I. Platzek, F. Hofheinz, H. J, Mutsaerts, **I. Asllani**, M. J. van Osch, A. Seidlitz; C. Jentsch, J. Maus, M. Baumann, M. Krause, Jörg van den Hoff, Photon vs. proton radiochemotherapy: effects on brain tissue volume and perfusion, *Radiotherapy and Oncology,* 2018.
- J. Petr, H. J. M. Mutsaerts, E. de Vita, R. Steketee, M. Smits, J. van de Hoff, **I Asllani***, Effects of systematic PVE errors on the estimation of GM CBF with ASL MRI, *MAGMA*, 2018.
- F. Liu, Y. Duan, B. S. Peterson**, I Asllani**, F. Zelaya, A. Kangarlu, Resting State Cerebral Blood Flow with Arterial Spin Labeling MRI in Developing Human Brains, *Eur J Pediat Neur*, 2017.
- R. Marshall, M. K. Pavol, **I. Asllani**, R. Lazar, Altered cerebral hemodynamics and cortical thinning in asymptomatic carotid artery stenosis, Plos One, 2017.
- N. Doorenweerd, E. M. Dumas, S. Schmid, A. Roest, E. W. van Zwet, A. G. Webb, M. A. van Buchem, **I. Asllani**, M.J.P. van Osch, H. E. Kan, Reduced cerebral blood flow in Duchenne muscular dystrophy patients, Neuromuscular Disorders, 2017.
- **I. Asllani***, P. Slattery, A. Fafard, M. K. Pavol, R. M. Lazar, R. S. Marshall, Measurement of Cortical Thickness Asymmetry in Carotid Occlusive Disease, NeuroImage: Clinical, 2016.
- R. S. Marshall, M. K. Pavol, Y. K. Cheung, I. Strom, K. Slane, **I. Asllani**, R. M. Lazar, Dissociation among hemodynamic measures in asymptomatic high grade carotid artery stenosis, J Neurological Sciences, 2016.
- D. E. Bruening, S. Dharssi, R. M. Lazar, R. S. Marshall, **I. Asllani***, Improved partial volume correction method for detecting brain activation in disease using Arterial Spin Labeling (ASL) fMRI, Proc IEEE EMBS, 2015.
- Y. Qiu, A. Borogovac, A. Laine, J. Hirsch, **I. Asllani***, Tissue specific ASL fMRI: a superior method for imaging cerebral blood flow in aging and disease, Proc IEEE EMBS, 2014.
- S. A. Schobel, N. H. Chaudhury, U. A. Khan, M. A. Styner, **I. Asllani**, C. M. Corcoran, J. A. Lieberman, H. Moore, S. A. Small, Imaging patients with psychosis and a mouse model establishes a spreading pattern of hippocampal dysfunction and implicates glutamate as a driver, Neuron, 2013.
- A. Borogovac and **I. Asllani***, Arterial Spin Labeling (ASL) fMRI: advantages, theoretical constrains, and experimental challenges in neurosciences, J Biomedical Imaging, 2012.
- M. A. Lindquist, J. Spicer, **I. Asllani**, and T. D. Wager, Estimating and testing variance components in a multi-level GLM, NeuroImage, 2011.

- A. Borogovac, C. Habeck, S. Small, and **I. Asllani***, Mapping brain function using a 30-day interval between baseline and activation: A novel arterial spin labeling (ASL) fMRI approach, J of Cerebral Blood Flow & Metabolism, 2010.
- E. T. Petersen, et al., The QUASAR reproducibility study, Part II: Results from a multi-center ASL test-retest study, NeuroImage, 2009.
- **I. Asllani***, C. Habeck, A. Borogovac, T. R. Brown, A. M. Brickman, and Y. Stern, Separating function from structure in perfusion imaging of the aging brain, Human Brain Mapping, (2009).
- J. Spicer, L. Leotti, I. Asllani, A. Borogovac, M. Lindquist, T. Wager, Using Perfusion fMRI to Identify Brain Mechanisms of Social Evaluative Threat, NeuroImage, 2009
- A. Brickman, J. Muraskin, J. Steffener, A. Borogovac, T. Brown, C. Habeck, **I. Asllani**, Y. Stern, Reduction in CBF in areas appearing as WM hyperintensities on MRI, Psychiatry Research, 2009.
- **I. Asllani***, A. Borogovac, T.R. Brown, A Regression Analysis Algorithm Correcting for Partial Volume Effects in ASL MRI, Magnetic Resonance Medicine, 2008.
- **I. Asllani***, A. Borogovac, C. Wright, R. Sacco, T. R. Brown, and E. Zarahn, An Investigation of Statistical Power for Continuous Arterial Spin Labeling Imaging at 1.5T, NeuroImage, 2008.
- **I. Asllani***, C. Habeck, N. Scarmeas, A. Borogovac, T.R. Brown, and Y. Stern, Multivariate and Univariate Analysis of CASL CBF in Alzheimer's Disease, Journal of Cerebral Blood Flow & Metabolism, 2008.
- **I. Asllani***, E. Shankland, T. Pratum and M. Kushmerick, Effects of pH and Molecular Charge on Dipolar Coupling Interactions of Solutes in Skeletal Muscle Observed by DQF, ^{1}H NMR spectroscopy, J Magnetic Resonance, 2003.
- **I. Asllani***, E. Shankland, T. Pratum and M. Kushmerick, Double Quantum Filtered ^{1}H NMR Spectroscopy Enables Quantification of Lactate in Muscle, J Magnetic Resonance, 2001.
- **I. Asllani***, E. Shankland, T. Pratum and M. Kushmerick, Anisotropic Orientation of Lactate in skeletal Muscle Observed by dipolar Coupling in ^{1}H NMR spectroscopy, Journal of Magnetic Resonance, 1999.
- **I. Asllani**, S. Jubrias, M. Kushmerick, G. Crowther and K. Conley, Cellular Diversity Does Not Confound Mechanical And Energetics Measurements, Med.& Sci. in Sports & Exercise, 1998.

In submission:
- B. Orzsik, N. Harrison, G. Madelin, M. Cercignani, **I. Asllani***, Point Spread Function drives partial volume effects in ^{23}Na MRI, *Mag Res Med*
- **I. Asllani***, F. di Lorenzo, B. Orzsik, G. Madelin, N. Harrison, M. Cercignani, Effect of tDCS on ^{23}Na MRI, *J or Neuroscience*,
- B. Orzsik, M. Van Osch, T. Okell, A. Colassanti, M. Cercignani, **I. Asllani***, Microstructural dynamics of water measured by combining Arterial Spin Labeling with Diffusion Weighted MRI, *J Cereb Blood Flow and Metabolism*

Selected conference presentations (past 3 years, with peer review practice):
- **I. Asllani**, F. di Lorenzo, B. Orzsik, J. Wood, M. Bozzali, M. Cercignani, Short-term effects of transcranial direct current stimulation (tDCS) on cerebral blood flow measured with ASL MRI, ISMRM, virtual meeting, 2020.
- **I. Asllani**, T. Okell, M. Bozzali, M. Cercignani, Diffusion based PV-correction of ASL perfusion MRI, Human Brain Mapping, Milano, Italy (2019)
- **I. Asllani**, G. Madelin, M. Bozzali, M. Cercignani, Measurement of Intraneurite Sodium Concentration from NODDI-based Partial Volume Correction of in vivo 23Na MRI, ISMRM, Montreal, Canada, 2019
- J. Liao, J. Petr, R. Lazar, R. Marshall, **I. Asllani**, Effect of brain extraction of low resolution Arterial Spin Labeling (ASL) fMRI images on realignment and coregistration, IEEE Engineering in Medicine and Biology Conference (EMBC), 2017
- J. Petr, H. J. M. Mutsaerts, E. De Vita, J. Maus, J van den Hoff, **I. Asllani**, Deformation and resolution issues in partial volume correction of 2D arterial spin labeling data, International Society for Magnetic Resonance in Medicine (ISMRM), 2017.

Grants Pending and in Submission

▸ ASL based Brain Atlas (ABBA): using perfusion to track aging related diseases NIH NINDS R03, in revision, Role: Principal Investigator (PI), Amount requested: $436,000 over 3 years.

▸ Multi-parametric quantification of brain metabolism in vivo using advanced MRI Role: PI, Amount requested: $270,000, over 2 years

Active Grants

▸ Blood Flow & Cognition NIH/NINDS R01-NS076277, Asllani institution PI, Amount awarded: $300,000

▸ Neuropsychiatric and Brain Imaging Phenotyping of primary Mitochondrial Diseases MitCanada, Role: Co-PI, Amount awarded: $60,000 CAD, over 2 years.

▸ Research Initiative for Scientific Enhancement, National Institute of General Medical Sciences, NIH, Award R25GM122672, Role: Co-Investigator, Amount awarded: $800,000

Completed Grants

– Combining multivariate analysis with ASL MRI for early detection of Alzheimer's disease; NIH/NIA R01 AG030427, Co-Investigator, C. Habeck PhD (PI), (09.2007 – 06.2012)

– Exercise, Age-Related Memory Decline, and Hippocampal Function; NIH: AG035015-01A1, Co-Investigator, SA Small MD (PI), (07.2010 – 06.2015)

– Dietary flavonals, exercise, and hippocampal function, Mars Inc. industrial grant, Co-Investigator, SA Small MD (PI), (05.2009 – 04.2014)

– Brain pathways in social evaluative threat; NIH R21 MH082308, Co-Investigator, T. Wager PhD (PI), (03.2009 – 02.2011)

– Exercise and Inflammation: Autonomic, Affective & Cellular Mechanisms; NIH: R01 HL094423-01A1, Co-Investigator, R. Sloan (PI), (9.2009 – 05.2013)

– Exercise, aging, and cognition: Effects and mechanisms; NIH/NIA: R01 AG033546-01A2, Co-Investigator, Yaakov Stern PhD (PI), (09.2010 – 06.2015)

– Adult Neurogenesis: Bridging the gap between macro and micro neurosciences; SALK Grant 0714813, Co-Investigator, Scott Small MD (PI) (09.2007 – 09.2012)

– Exercise and Aging; NYSTEM IIRP N09G-26, Co-Investigator, Scott Small (PI), (09.10 – 08.13)

– Imaging correlates of schizophrenia; NIH K23MH090563, K-award mentor, Scott Schobel K-23, PI, (07.2011 – 06.2016)

– Longitudinal Imaging of Patients at Clinical Risk for Psychosis; NIH 1R01MH093398-01A1, Co-Investigator, Scott Small (PI), (12.2001 – 11.2016)

– Diaschisis after stroke: a novel approach with arterial spin labeling MRI; NIH/NINDS R21 NS054718-01A1, Co-Investigator, John Krakauer MD (PI), (02.2007 – 02.2009)

– Functional Anatomy of Visuomotor Learning & Motor Memory; NIH/NINDS 5R01 NS052804-02, Co-Investigator, John Krakauer MD (PI), (04.2007-03.2012)

– Arterial Spin Labeling MRI and Alzheimer's disease; NIH R01 P50 AG08702-15, Co-PI, Michael Shelanski (PI) (09.1989 – 05.2005)

– Early AD detection via arterial spin labeling MRI and covariance analyses; NIH/NIA R21 IIRG-04-1353, Co-Investigator, Yaakov Stern (PI), (07.2004 – 06.2007)