

GUGLIELMO GENOVESE

ASSOCIATE PROFESSOR

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Date and Place of birth: 09/12/1989, Rome

Department of Neuromedicine and Movement Science
Faculty of Medicine and Health Science,
Norwegian University of Science and Technology
Edvard Griegs gate 6
Trondheim, 7060, Norway

EDUCATION

PhD Magnetic Resonance Physics and Neuroscience

December 2019

Brain-Cognition-Behaviour Doctoral School (ED3C), Sorbonne University, Paris, France
Dissertation: "*Evaluation of microstructural alterations in the human brain and in experimental models with diffusion-weighted magnetic resonance spectroscopy*"
Primary Supervisor: Prof Stéphane Lehericy, Centre de NeuroImagerie de Recherche (CENIR)
Institut du Cerveau et de la Moelle épinière (ICM)
Secondary Supervisor: Dr Francesca Branzoli, Centre de NeuroImagerie de Recherche (CENIR)
Institut du Cerveau et de la Moelle épinière (ICM)

MSc Physics of Biosystems

September 2016

Sapienza University of Rome, Rome, Italy
Thesis: "*Simulations of molecular diffusion on heterogeneous systems to optimize nuclear magnetic resonance experiments in human tissues*"
Supervisor: Prof Silvia Capuani, NMR Laboratory, Physics Department, Sapienza University of Rome, Rome, Italy
Co-supervisor: Dr Marco Palombo, Department of Computer Science, University College London, UCL, London, UK

BSc Physics

December 2012

Sapienza University of Rome, Rome, Italy
Thesis: "*Critical issues of neural network simulation on massively parallel architectures*"
Supervisor: Dr Pier Stanislao Paolucci, Parallel/Distributed Computing Laboratory (APE), National Institute for Nuclear Physics (INFN), Rome, Italy

FELLOWSHIPS AND AWARDS

Outstanding Academic Fellows Programme (NTNU)

2024

Awarded by the NTNU (Norwegian University of Science and Technology) for researchers have excelled internationally in their fields of research, June 5, 2024

Onsager Fellowship (NTNU)

2023

Awarded by the NTNU (Norwegian University of Science and Technology) for tenure-track associate professor's duties, June 22, 2023

ISMRM Psychiatric MR Spectroscopy & Imaging Abstract Award: 2nd Place

2023

Awarded by the ISMRM Psychiatric MR Spectroscopy & Imaging for abstract accepted at the ISMRM 31st Annual Meeting June 02-08, 2023

ISMRM Educational Stipend

2023

Awarded by the International Society for Magnetic Resonance in Medicine (ISMRM) to cover the registration fees to the ISMRM 31st Annual Meeting June 02-08, 2023

ISMRM Educational Stipend

2021

Awarded by the International Society for Magnetic Resonance in Medicine (ISMRM) to cover the registration fees to the ISMRM 29th Annual Meeting May 15-20, 2021

ESMRMB Student Support Program

2019

Awarded by the European Society for Magnetic Resonance in Medicine and Biology (ESMRMB) to cover the registration fees to the ESMRMB 2019 Congress

SFRMBM/FLI Travel Grant

2019

Awarded by the French Society for Magnetic Resonance in Biology and Medicine (SFRMBM), in collaboration with France Life Imaging (FLI), to cover the registration fees to the ESMRMB 2019 Congress

ISMRM Magna Cum Laude Merit Award

2019

Awarded by the International Society for Magnetic Resonance in Medicine (ISMRM) for abstract accepted at the ISMRM 27th Annual Meeting May 11-16, 2019

ISMRM Educational Stipend

2019

Awarded by the International Society for Magnetic Resonance in Medicine (ISMRM) to cover the registration fees to the ISMRM 27th Annual Meeting May 11-16, 2019

SFRMBM Travel Grant

2018

Awarded by the French Society for Magnetic Resonance in Biology and Medicine (SFRMBM) to cover the registration fees to the joint Annual Meeting ISMRM-ESMRMB June 16-21, 2018

RESEARCH EXPERIENCE

Associate Professor, Department of Neuromedicine and Movement Science, Norwegian University of Science and Technology, Trondheim, Norway

2023 to now

- Overseeing 7T-MR Spectroscopy (MRS) experiments; responsible for analysis and interpretation of MRS data from migraine patient.
- Conceptualizing of strategy optimization for a reliable evaluation of macromolecular signal from 7-T human MRS data.
- Overseeing 7T-MR Spectroscopy (MRS) experiments; responsible for analysis and interpretation of MRS data from Alzheimer's disease patients.
- Implementing dynamic-MRS sequences at 7 T.
- Mentorship of PhD, MSc and MD students.

Post-doctoral associate, Center for Magnetic Resonance Research, University of Minnesota, Minneapolis, USA

2020 to 2023

Supervisors: Prof Małgorzata Marjańska

- Overseeing 7T-MR Spectroscopy experiments; responsible for analysis and interpretation of MRS data for major depressive disorders in adolescents.
- Conceptualizing of strategy optimization for a reliable evaluation of GABA concentration from 7-T human MRS data.
- Conceptualizing of critical analysis of denoising algorithm (low rank matrix models) applied to dynamic-process MRS data.
- Collaborating on multisite 7T-MRS experiment for adult aging: overseeing the MRS protocol; responsible for MRS data collection for the University of Minnesota site.
- Overseeing 10.5T-MRS and MRS Imaging (MRSI) experiments: responsible for optimization of MRS/MRSI data collection.
- Conducting MRS clinical diagnostic scans at 7 T in tumor patients.

PhD Dissertation, Institut du Cerveau et de la Moelle épinière, Paris, France

2017 to 2019

Supervisors: Prof Stéphane Lehericy and Dr Francesca Branzoli

- Optimization of Diffusion-Weighted Magnetic Resonance Spectroscopy (DW-MRS) acquisition protocols and data post processing methods in human subjects.
- Validation of DW-MRS metrics with histological markers (mouse model of multiple sclerosis and Pelizaeus-Merzbacher disease).

- Development of neuroimaging biomarkers for the characterisation of ischemic stroke progression with DW-MRS.

MSc Dissertation, NMR Laboratory, Physics Department, Sapienza University of Rome, Rome, Italy
2014 to 2016

Supervisors: Prof Silvia Capuani and Dr Marco Palombo

- Development of MonteCarlo Random Walks algorithms, optimized for parallel computing on GPU, to simulate the anomalous molecular diffusion in biological tissue for DW signal optimization.

PUBLICATIONS

Journal papers

G Genovese, M Marjańska, E J Auerbach, L Yahia Cherif, I Ronen, S Lehericy, F Branzoli, “*In vivo diffusion-weighted MRS using semi-LASER in the human brain at 3 T: methodological aspects and clinical feasibility*”, NMR in Biomedicine; May 2021; 34(5): e4206. doi: 10.1002/nbm.4206.

G Genovese, M Palombo, M Santin, J Valette, C Ligneul, M Aigrot, N Abdoukader, D Langui, A Millecamps, A Baron-Van Evercooren, B Stankoff, S Lehericy, A Petier, F Branzoli, “*Inflammation-driven glial alterations in the cuprizone mouse probed with diffusion-weighted magnetic resonance spectroscopy at 11.7 T*”, NMR in Biomedicine; April 2021; 34(4): e4480. doi: 10.1002/nbm.4480.

G Genovese, B Diaz-Fernandez, F Lejeune, I Ronen, M Marjańska, L Cherif, S Lehericy, F Branzoli, C Rosso, “*Longitudinal monitoring of microstructural alterations in cerebral ischemia by in vivo diffusion-weighted magnetic resonance spectroscopy*”, Radiology; November 2022; doi: 10.1148/radiol.220430.

G Genovese, D Deelchand, M Terpstra, M Marjańska, “*Quantification of GABA concentration in human brain from 7-T ultra-short-TE MR spectra*”, Magnetic Resonance in Medicine; November 2022; doi:10.1002/mrm.29514.

G Genovese, M Terpstra, P Filip, S Mangia, J McCarten, L Hemmy, and M Marjańska, “*Age-related differences in macromolecular resonances observed in ultra-short-TE STEAM MR spectra at 7 T*”, Magnetic Resonance in Medicine; March 2024, doi:10.1002/mrm.30061

C Özütemiz, M White, W Elvendhal, Y Eryaman, G Metzger, R Patriat, N Harel, M Marjańska, J Kulesa, A Grant, **G Genovese**, Z Cyaci, “*Clinical Neuroradiology Applications of 7T MRI: Indications, Sequence Parameters, Pitfalls, and Solutions. A Single-Center Clinical Experience*”, American Journal of Roentgenology; July 2023; doi:10.2214/AJR.23.29342.

C Ligneul, C Najac, A Döring, F Branzoli, W Clarke, C Cudalbu, **G Genovese**, S Jbabdi, I Jelescu, R Kreis, H Lundell, M Marjańska, H Moeller, J Mosso, E Mougél, S Ruschke, K Simsek, F Szczepankiewicz, G Oeltzschner, M Palombo, I Ronen, J Valette, “*Diffusion-weighted MR spectroscopy: consensus, recommendations and resources from acquisition to modelling*”, Magnetic Resonance in Medicine; November 2023; doi:10.1002/mrm.29877.

K Şimşek, C Gallea, **G Genovese**, S Lehericy, F Branzoli, M Palombo, “*Age-trajectories of higher-order diffusion properties of major brain metabolites in cerebral and cerebellar grey matter using in vivo diffusion-weighted MR spectroscopy at 3T*”, bioRxiv, June 2024; doi:10.1101/2024.06.04.597406.

L Hingerl, B Strasser, S Schmidt, K Eckstein, **G Genovese**, E Auerbach, A Grant, M Waks, P Lazen, A Sadeghi-Tarakameh, G Hangel, F Niess, Y Eryaman, G Adriany, G Metzger, W Bogner, M Marjańska, “*Exploring In Vivo Human Brain Metabolism at 10.5 T: Initial Insights from MR Spectroscopic Imaging*”, submitted to Human Brain Mapping

G Genovese and M Marjańska, “*Low-rank approximation denoising algorithms compromise the reliability of diffusion weighted MRS data*”, in preparation.

G Genovese, C Ozger, PE Croarkin, M Marjańska, “*Neurochemical profile of major depressive disorder in adolescents: 7 T MRS study*”, in preparation.

A Jain, A Farestveit, B Sitter, T W Meisingset, **G Genovese**, “*7T ¹H-MRS of thalamus and hypothalamus in chronic cluster headache*”, in preparation

PRESENTATIONS

Conference Talk, “*Age-related differences in macromolecular resonances observed in ultra-short-TE STEAM MR spectra at 7 T*”, 32th Annual Meeting of the ISMRM, May 6th 2024, Singapore

Invited Talk, “*Introduction to magnetic resonance spectroscopy*”, Measuring metabolism in the human brain: Translational challenges and opportunities, April 8th 2024, Trondheim, Norway

Invited Talk, “*Denoising in MRS using low-rank methods*”, 2023 Minnesota Workshop on Ultra-High Field Imaging, October 13th 2023, Minneapolis, Minnesota, USA

Conference Talk, “*Neurochemical profile of major depressive disorder in adolescents: 7 T MRS study*”, Business Meeting Psychiatric MR Spectroscopy & Imaging at 31st Annual Meeting of the ISMRM, June 7th 2023, Toronto, Ontario, Canada

Conference Talk, “*Evolution of glial and axonal changes in human brain tissue after ischemic stroke investigated with diffusion-weighted magnetic resonance spectroscopy at 3 T*”, 36th Annual Meeting of the ESMRMB, October 5th 2019, Rotterdam, Netherlands

Conference Talk, “*Glial and axonal changes in mouse models of disease investigated with diffusion-weighted magnetic resonance spectroscopy at 11.7 T*”, 27th Annual Meeting of the ISMRM, May 13th 2019, Montréal, Québec, Canada

Conference Talk, “*Reproducibility and clinical feasibility of diffusion-weighted MRS using DW-sLASER and DW-STEAM in the human brain in vivo at 3T*”, 26th Annual Meeting of ISMRM, June 21th 2018, Paris, France

PROFESSIONAL TRAINING

CMRR 10.5T Operator, Minneapolis, MN, USA, June 16th 2022
Description: Certification for human scanning at 10.5T (Siemens scanner)

CMRR 7T/Terra operator, Minneapolis, MN, USA, March 16th 2021
Description: Certification for human scanning at 7T/Terra (Siemens scanner)

CMRR 3T/Prisma operator, Minneapolis, MN, USA, February 27th 2020
Description: Certification for human scanning at 3T/Prisma (Siemens scanner)

ESMRMB Lectures on MR, Diffusion: From acquisition to tissue microstructure, Lisbon, Portugal, September 3-5 2018
Description: An introductory course to methods for DW-MRI.

FELASA B Certificate, Paris, France, June 28th 2017
Description: e-learning training “Personnel Responsible for Designing Procedures and Projects, Category C (Function B – Directive 2010/63EU)”

PROFESSIONAL AFFILIATIONS

European Society for Magnetic Resonance in Medicine and Biology (ESMRMB), 2024-now
Full member

International Society for Magnetic Resonance in Medicine (ISMRM), 2024-now
Full member

International Headache Society (HIS), 2023-now
Full member

International Society for Magnetic Resonance in Medicine (ISMRM), 2018-2023
Trainee member

European Society for Magnetic Resonance in Medicine and Biology (ESMRMB), 2018-2020
Junior member

French Society for Magnetic Resonance in Biology and Medicine (SFRMBM), 2018-2020
Student member