

Summary of main achievements

At the University of Bologna, I built a solid foundation in mathematical and computational skills. During my master's in applied physics, I deepened my skills in imaging analysis. Since then, brain MRI has been my main research focus. I worked at the Bologna Functional and Molecular Neuroimaging unit for five years, where I collaborated on ongoing Bologna clinical trials and multicenter collaborations as one of the main physicists for neuroimaging. My main focus was software development for quantitative MRI biomarkers for clinical usage. The investigation of different pathologies provided me with a broad spectrum of consolidated imaging knowledge in neurology and neuroradiology. Among these, neurodegeneration and correlation analysis with genetic mutations were the main fields of research. As a visiting PhD student at King's College London, I worked with dementia and vascular injuries leading to language impairments. I developed a novel approach to atlas mapping of lesion impact. This work I expanded further at the University of Bordeaux, where I developed a new framework and a web application to evaluate long-term symptom severity after stroke, in collaboration with UCL and the University of Padua. At Stanford, I am expanding my research horizons to genetic investigations by joining the Greicius Lab. I aim to develop novel strategies for modeling Alzheimer's pathology genetic risk scores.

Professional experience

Postdoctoral positions:

01/08/2022 – current	Stanford University School of Medicine , Department of Neurology & Neurological Sciences. Sponsor Prof. Michael Greicius. Lab member of the Greicius Lab. Grant R35 for <i>long-read sequencing study of structural variants in the Stanford ADRC patients</i> (1 month).
05/10/2020 – 31/07/2022	Bordeaux Centre National de la Recherche Scientifique , Groupe d'Imagerie Neurofonctionnelle. Supervisor Prof. Michel Thiebaut de Schotten. Lab member of the Brain Connectivity and Behavior Laboratory, Sorbonne Universities (Paris). Grant Disconnectome ERC for <i>predicting stroke clinical symptoms from white matter</i> (22 months).
1/10/2019-30/09/2020	Bologna Functional and Molecular Neuroimaging unit , Bellaria Hospital. Tutor Prof. Caterina Tonon. Grant <i>Neurometabolic MRI study and genetic-clinical correlations in mtDNA mutation pathologies</i> (12 months).

Collaborator positions:

01/11/2020 – current	Digital content producer for the Clinical Neuroanatomy Seminar online platform led by Dr. Stephanie Forkel, with >1.7K channel subscribers.
01/09/2017-30/09/2020	International multicenter project collaborator of the Enhancing Neuro Imaging Genetics through meta-analysis (ENIGMA) Ataxia group for the Bologna group (P.I. Prof Raffaele Lodi), <i>we investigated genetic-driven brain atrophy patterns</i> .
28/08/2017-27/08/2018	Multicenter project collaborator of the Italian Network of Neuroscience and Neurorehabilitation for the Bologna Bellaria Hospital. <i>Alzheimer's disease clinical data and MRI sequences were harmonization across centers</i> (12 months contract).

Education

Doctoral period:

1/10/2016-30/09/2019	PhD in Biomedical and Neuromotor Sciences. Bologna University Tutors: Prof. Claudia Testa and Prof. Caterina Tonon. Thesis title: <i>Advanced neuroimaging methodologies to improve connectivity detection in normal and abnormal language brain networks</i> . PhD defense: 29/11/2019 , external committee: Emiliano Ricciardi (Pisa) and Antonella Castellano (Milano). (3 years program)
1/09/2018-30/05/2019	Visiting student King College London, Neuroanatomy and Tractography laboratory . Tutor Prof. Marco Catani. Project: <i>Structural network analysis of the brain connectome to evaluate language and aphasia recovery</i> (9 months Marco Polo scholarship).

Pre-doctoral period:

09/1/2015-30/09/2016	Research Internship Functional Magnetic Resonance Unit , S.Orsola Hospital (University of Bologna). Tutor Prof. Claudia Testa. <i>Implementation of advanced software and acquisitions for tractography pipelines</i> .
1/11/2013-1/04/2016	Master's degree in Applied Physics , Astrophysics and Physics Department, School of Science, Bologna University, Italy. Score: 110/110 <i>Graduated with honors</i> .
1/09/2010-25/10/2013	Bachelor's degree in Physics , Physics Department, School of Science, Bologna University, Italy. Score: 105/110.
09/04/2013-19/04/2013	Research Internship European Synchrotron Radiation Facility , General Purpose Italian beamline for Diffraction and Absorption (Grenoble). Tutor Prof. Federico Boscherini. <i>Study of X-ray absorption spectrum using Synchrotron light</i> .

Prizes and Awards

2022	Seal of excellence for the MSCA HORIZON-MSCA-2021-PF-01-01.
2022	Top ranked OHBM Glasgow abstract, merit travel stipend (\$2000)
2019	Best poster selection, 10th Annual Meeting ISMRM Italian Chapter.
2009	Top 100 best Italian high school students, national selection by Sant'Anna Pisa University.

Funding

2020	Educational stipend ISMRM virtual annual meeting (\$755).
2019	Guarantors of Brain UK travel grant (£500).
2019	Italian Association for Magnetic Resonance in Medicine grant (€75 + accommodation)
2018	Research exchange grant London-Bologna, Marco Polo International (€7,000)
2018	Educational stipend for the ISMRM annual meeting in Paris (\$525).
2017	Educational stipend for the ISMRM annual meeting in Honolulu (\$475).
2016	PhD grant 3-years, basic research in translational biomedical studies, Bologna University.

Developed software

Web application: <http://disconnectomestudio.bcblab.com>

Publications

H-Index=7 (Google scholar source)

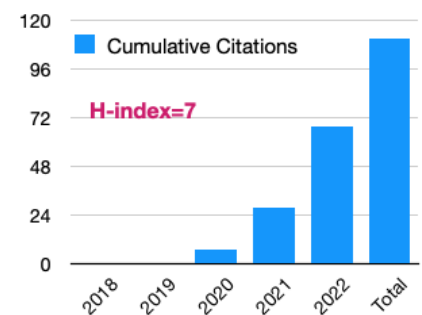
N=13 peer-reviewed papers

N=5 papers under review

N=1 book in preparation

Total number of citations=118

First/Co-first author papers listed first.



1. **Talozzi L**, Forkel JS, Pacella V, Nozois V & Thiebaut de Schotten M. **Latent disconnectome prediction** of long-term cognitive symptoms in **stroke**. Brain, under-review.
2. Zoli M§, **Talozzi L§**, Martinoni M, Manners DN [...] & Tonon C. From neurosurgical planning to histopathological **brain tumor characterization**: potentialities of arcuate fasciculus along-tract diffusion tensor imaging tractography measures. Frontiers in Neurology. 2021.
3. Zoli M§,**Talozzi L§**, Mitolo M, Lodi R, Mazzatenta D, Tonon C. Role of Diffusion MRI Tractography in **Endoscopic Endonasal Skull Base Surgery**. Journal of Visual Experiences. 2021.
4. **Talozzi L**, Testa C, Evangelisti S, Cirignotta L [...] & Lodi R. **Along-tract analysis** of the arcuate fasciculus using the Laplacian operator to evaluate different **tractography methods**. Magnetic Resonance Imaging. 2018.
5. Dulyan L, **Talozzi L**, Pacella V, Corbetta M, Forkel SJ, Thiebaut de Schotten M. Longitudinal prediction of **motor dysfunction after stroke**: a disconnectome study. Brain Structure and Functions, 2022.
6. Thiebaut de Schotten M, Pacella V, **Talozzi L**, Forkel JS. **An Atlas of the Function of Human Brain Connections**. Oxford University Press, proposal accepted.
7. Pacella V, Nozois V, **Talozzi L**, Forkel JS, Thiebaut de Schotten M. Unravelling the fabric of the human mind: the brain-cognition space. Under revision in Nature.
8. Nozois V, Forkel S, **Talozzi L**, Petit L, Thiebaut de Schotten M, Joliot M. Atlasing white matter and grey matter joint contributions to resting-state networks in the human brain. Under revision in Communication Biology.
9. Mitolo M, D'Adda F, Evangelisti S, Pellegrini L, Gramegna LL, Bianchini C, **Talozzi L** [...] & Tonon C. Emotion dysregulation, impulsivity and anger rumination in Borderline Personality Disorder: the role of amygdala and insula. Under revision in European Archives of Psychiatry and Clinical Neuroscience.

10. Lim L, **Talozzi L**, Howells H, Wong G. Examining Brain Structural Connectivity in **Early-life Interpersonal Stress**. BMC psychiatry, under-review.
11. Mitolo M, Stanzani Maserati M, Manners DN, Capellari S, Testa C, **Talozzi L** [...] & Tonon C. The Combination of Metabolic Posterior Cingulate Cortical Abnormalities and Structural Asymmetries Improves the Differential Diagnosis Between Primary Progressive Aphasia and **Alzheimer's Disease**. Journal of Alzheimer's Disease. 2021.
12. Ratti S, Rusciano I, Mongiorgi S, Obeng EO, Cappellini A, Teti G, Falconi M, **Talozzi L** [...] & Ramazzotti G. Cell signaling pathways in **autosomal-dominant leukodystrophy (ADLD)**: the intriguing role of the astrocytes. Cellular Molecular Life Sciences. 2021.
13. Evangelisti S, Gramegna LL, La Morgia C, Di Vito L, Maresca A, **Talozzi L** [...] & Tonon C. Molecular biomarkers correlate with brain grey and white matter changes in patients with **mitochondrial m.3243A>G mutation**. Molecular Genetics and Metabolism. 2021.
14. Gramegna LL, Evangelisti S, Di Vito L, La Morgia C, Maresca A, Caporali L, Amore G, **Talozzi L** [...] & Lodi R. Brain MRS correlates with mitochondrial dysfunction biomarkers in MELAS-associated **mtDNA mutation**. Annals Clinical Translational Neurology. 2021.
15. Gramegna LL, Cortesi I, Mitolo M, Evangelisti S, **Talozzi L** [...] & Lodi R. **Major cerebral vessels involvement** in patients with MELAS syndrome: Worth a scan? A systematic review. Journal of Neuroradiology. 2021.
16. Mitolo M, Stanzani-Maserati M, Capellari S, Testa C, Rucci P, Poda R, Oppi F, Gallassi R, Sambati L, Rizzo G, Parchi P, Evangelisti S, **Talozzi L** [...] & Liguori R. Predicting conversion from mild cognitive impairment to **Alzheimer's disease** using brain 1H-MRS and volumetric changes: A two-year retrospective follow-up study. Neuroimage Clinical. 2019.
17. Testa C, Calandra-Buonaura G, Evangelisti S, Giannini G, Provini F, Ratti S, Cecere A, **Talozzi L** [...] & Cortelli P. Stridor-related gray matter alterations in **multiple system atrophy**: A pilot study. Parkinsonism Related Disorders. 2019.
18. Evangelisti S, Pittau F, Testa C, Rizzo G, Gramegna LL, Ferri L, Coito A, Cortelli P, Calandra-Buonaura G, Bisquoli F, Bianchini C, Manners DN, **Talozzi L** [...] & Lodi R. L-Dopa Modulation of Brain Connectivity in **Parkinson's Disease** Patients: A Pilot EEG-fMRI Study. Frontier in Neuroscience. 2019.
19. Morisi R, Manners DN, Gnecco G, Lanconelli N, Testa C, Evangelisti S, **Talozzi L** [...] & Lodi R. Multi-class **parkinsonian disorders** classification with quantitative MR markers and graph-based features using support vector machines. Parkinsonism Related Disorders. 2018.

Invited presentations (Rewatch in my YouTube channel (named Lia Talozzi))

Internationally established conferences and/or international advanced schools:

22/06/2022	Oral presentation at the OHBM international meeting, Glasgow.
25/02/2022	Oral presentation at the Brain conference.
27/10/2021	Guest lecturer Columbia University, Fundamental of human psychology, Prof. Alfredo Spagna.
20/20/2021	Invited speaker at the Bordeaux University Euro-Mediterranean Online Master of Neuroscience.
9/10/2021	Invited speaker at the Padova Open Neuroscience Symposium.
20/04/2018	Invited speaker of the Bologna Exposanità conference.
8-9/06/2017	Two oral presentations at the Annual Meeting ISMRM Italian Chapter, Gaeta.

Invited speaker to organized meetings:

05/04/2022	Grenoble Alpes, Laboratoire de psychologie et neurocognition, leader Prof. Monica Baciù.
23/02/2022	Paris Institut du Cerveau, fonctions et dysfonctions de systèmes frontaux, leader Richard Levy.
22/02/2002	Iowa University, Department of Neurology, leader Prof Aaron D. Boes.
07/02/2022	Boston Univeristy, Aphasia Research Lab, leader Prof. Dr. Swathi Kiran.
03/02/2022	Moscow Center for Language and Brain, leader Prof. Olga Dragoy.

26/05/2021	London UCL High-Dimensional Neurology lab, leader Prof. Parashkev Nachev.
20/05/2021	Padova University, Neuroscience Center, leader Prof. Maurizio Corbetta.
11/05/2021	Paris, physiological investigations of clinically normal & impaired cognition, leader Prof. Paolo Bartolomeo.
5/05/2021	Stanford, Neurology and Neurological Sciences, leader Prof. Michael Greicius.

Abstract accepted in National and International congresses

N=14 accepted abstracts as first author:

N=7 international congresses (2 oral communication), N=7 Italian national congresses (2 oral communications).

N=23 accepted abstracts as a co-author:

N=6 international congress (1 oral communication), N=17 Italian national congress (3 oral communications).

Supervising and mentoring activities.

In 2022, I am supervising Maddie Dailey, a student in Biomedical Informatics at Stanford University, during the fall quarter. We are working together on the genetic long-range sequencing analyses.

In 2019, I supervised a bachelor's student in physics at Bologna University, Cantoni Elena. I was one of the thesis referees and have been part of the evaluation committee. I trained her for tractography methods and supervised her thesis production.

In 2017, I supervised a medical student at the Medical and Surgery School, Bologna University, Valeria Dambina. I trained her for manually segment multiple sclerosis white matter lesions and supervised her thesis production.

Teaching experience

In 2022, at the International OHBM meeting in Glasgow, I was a teacher for the Education session of the congress. I presented at the "Brain parcellation and functional territories" educational course. The lecture recording is openly available on YouTube.

In 2021, for the Euro-Mediterranean Online Master of Neuroscience, Bordeaux University, I organized one of the "hands-on" sections for manually segmenting stroke lesions and calculating white matter disconnections.

In 2021, during the Padova Open Neuroscience Symposium, I organized a one-day workshop for the first introduction of magnetic resonance imaging analyses and software use.

For two years (academic years 2017-2018 and 2019-2020), I gave lectures at the master's in medical biotechnologies at Bologna University. I was a tutor for the In-vivo metabolic diagnosis, chair Prof. Raffaele Lodi. In the same two academic years, I was teaching and examiner at the Bachelor in Orthopedic, Bologna University, for the Radioprotection course, chair Prof. Caterina Tonon.

Main international collaborations

In 2022, after moving to Stanford, I am collaborating with Prof. Michel Thieabut de Schotten in Bordeaux, and Stefanie J Forkel at the Donders Institute (NL), to finalize our work on white matter disruptions and clinical stroke symptoms. For patient recruitment and result discussion, I am collaborating with Dr. Etienne Allart, neuro-reeducator at the CHU Lille Hospital (FR), Prof Parashkev Nachev, University College London (UK), and Prof Maurizio Corbetta, Padova University (IT).

In 2020, I started collaborating with Dr. Lena Lim, King's College London (UK), to investigate early-life interpersonal stress influences brain white matter organization. We submitted a paper, which is currently under review, and I am supporting Dr. Ahmad Beyh, University College London (UK), who is continuing this project.

In 2019-2020, during my Ph.D., I worked on the longitudinal evaluation of Primary Progressive Aphasia patients tutored by Prof. Marco Catani at King's College London (UK). I collaborated with Prof M Marsel Mesulam, Northwestern University (IL), who collected the patients' MRI scans and clinical data. In the same period, I started collaborating with Stefanie J Forkel, working at the King's College Stroke Unit at the time, for language deficits after stroke investigated with MRI.

Computational Skills

Advanced code developing in Python, Bash, MATLAB, R. Advanced use of SPSS, MRtrix, and FSL software.

Web application development using Django, frontend (Java Script and CSS), backend and live production.

Language

Italian - native language. English - proficient, 1 month in the USA, 9 months in the UK, writing of scientific articles, oral presentations (C1-self assessment). French - medium, 2 years in France (B1-self assessment)

Contribution as reviewer to paper peer-reviewed publications (N=23)

Revisions were made for the following journals: Cortex (N=7), Brain Structure and Functions (N=6), Neuroimage: Clinical (N=4), Communications Biology (N=1), Scientific Reports (N=1), Human Brain Mapping (N=1), Frontiers in Human Neuroscience (N=1), Journal of Neurology (N=1), Neurocase (N=1).

Science divulgation initiatives

Team member since 2020 of Clinical Neuroanatomy Seminars, online event organization & streaming, weekly #neuroccino, monthly #CNStalk (>1.7K Followers on YouTube).

2018, Speaker for the Festival of Medical Sciences, Bologna (IT).

Academic organizations/memberships

2022-2023 Member of the Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART)

2018-2022 Member of the Organization for Human Brain Mapping (OHBM).

2018-2021 Member of the Italian Association for Doctoral and Postdoctoral researchers (ADI).

2016-2020 Member of the International Society of Magnetic Resonance in Medicine (ISMRM).