Fanny Munsch, PhD

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MRI scientist

Work experience

2019/ **Reviewer for the ISMRM** (57 abstract in 2024)

2022-10/ **MRI scientist** at the University of Bordeaux

- Role of MRI technologist to perform MRI exams realized in the context of clinical research involving patients suffering from brain and spinal cord disorders
- Analysis of MR images (structural, diffusion, fMRI) to better characterize and predict the evolution of neurological disorders, such as stroke, multiple sclerosis, Alzheimer's and Parkinson

2018-06/2022-09 **Research fellow** at Beth Israel Deaconess Medical Center, Division of MRI Research, Radiology Department, Harvard Medical School

- Analysis of resting state images (ASL / fMRI) using different post-processing methods
- Quantitative analysis of inhomogeneous magnetization transfer (ihMT) MRI
- EPIC (GE) MR pulse programming to add new features to the current ihMT implementation

2017-05/2018 **Research fellow** at Beth Israel Deaconess Medical Center, Neurology Department, Harvard Medical School

- Co-investigator on the project 2017P-000252 funded by the NIH entitled "Imaging the Neural Effects and Testing Behavioral Correlations of tDCS"
- Prediction of aphasia and motor outcome in stroke patients using brain MRI biomarkers

2016-2017 **Engineer** at Aquitaine Science Transfert (Society of Acceleration and Technology Transfer) on assignment at the Neuroimaging Department of the University Hospital Bordeaux

- Improvement of the imaging method developed during the PhD training
- Software development and validation (on 300 new patients)

2012-2015 **Engineer in MR image post-processing** at Bordeaux University

- Funded by the TRAIL labex (Translational Research and Advanced Imaging Laboratory)
- Six-week internship at Center for Neurological Imaging, Harvard Medical School, Boston: use of a new automated method to segment Multiple Sclerosis lesions on FLAIR images

2012 **Six-month internship at General Electric Healthcare**

- Post-processing of fetal MR images

- Post-processing and statistical analysis of ASL images between patients suffering from mastocytosis and healthy volunteers using SPM

2011 **Three-month internship in the Netherlands** at the University Medical Center Utrecht

- Part of the MRI-accelerator project
- Detection of intrafraction motion between two MRI scans from cervical cancer patients
- Programs developed with Matlab

Education

2019 **GE EPIC programming course** at University of Wisconsin, Madison, WI

2012-2015 **PhD in Neurosciences: Prognosis after an ischemic stroke - Role of stroke location** supervised by **Dr Vincent Dousset**, head of the Neuroimaging Department at the University Hospital Bordeaux and **Dr Thomas Tourdias**, neuroradiologist

2009-2012 **Biomedical engineering** at Polytech Marseille (former ESIL) (Marseilles, France)

2007-2009 Selective preparatory classes leading to French elite institutes in Biology, Chemistry, Physics, Geology (Lyons, France)

Research skills

2012-Present **1. Prospective cohort study management** - More than 500 healthy volunteers and patients (ischemic stroke, multiple sclerosis and clinically isolated syndrome) in two research center Beth Israel Deaconess Medical Center and Bordeaux Hospital. Skills used:

- Recruitment of volunteers, including paperwork (eligibility, consenting among others)
- Preparing volunteers for MRI exam (electrodes positioning) and use of tDCS device
- Data recovery and archiving
- Image quality control
- Patient database management with Neurovascular Department's close collaboration

2. MR image post-processing and analysis

- Analysis of anatomical (3D T1 and FLAIR), structural (DTI) and functional (RS-fMRI, RS-ASL) images
- Extensive knowledge of image analysis softwares (Matlab, FSL, SPM, FreeSurfer, MRIcron, 3D Slicer, Trackvis, CONN)
- Development of an imaging method improving the prediction of cognitive outcome at 3-month poststroke during my thesis (protected by a patent)

3. MR pulse programming

- Introduction to GE EPIC pulse programming by adding new features to the current ihMT implementation

Teaching experience

2013-2017 **1. Teaching of imaging techniques to 1st year students in speech therapy school**

- Basic physics of MRI, PET and gamma cameras, Ultrasound, and X-ray

2. Students' supervision

- Master students in Neurosciences or Bioimaging
- Medical students (residents in Radiology) together with Dr Thomas Tourdias

Publications

F. Munsch *et al.*, Pharmacological manipulation of neurotransmitter activity induces disparate effects on cerebral blood flow and resting-state fluctuations. *Imaging Neuroscience* 2024

M. Taso, **F. Munsch**, *et al*., Fast-spin-echo versus rapid gradient-echo for 3D magnetization-prepared acquisitions: Application to inhomogeneous magnetization transfer. *Magn Reson Med.* 2023

S. Sagnier, G. Catheline, B. Dilharreguy, P.A. Linck, P. Coupé, **F. Munsch**, *et al.*, Microstructural gray matter integrity deteriorates after an ischemic stroke and is associated with processing speed. *Transl Stroke Res.* 2023

S. Sagnier, G. Catheline, B. Dilharreguy, P.A. Linck, P. Coupé, **F. Munsch**, *et al.*, Normal-appearing white matter deteriorates over the year after an ischemic stroke and is associated with global cognition. *Transl Stroke Res.* 2022

M. Taso, **F. Munsch**, D.C. Alsop, The Boston ASL Template and Simulator: Initial development and implementation. *J Neuroimaging*. 2022

G. Sprugnoli, **F. Munsch**, *et al.*, Impact of multisession 40Hz tACS on hippocampal perfusion in patients with Alzheimer's disease. *Alzheimers Res Ther*. 2021

A.B. Shinde, K.D. Lerud, **F. Munsch** *et al.*, Effects of tDCS dose and electrode montage on regional cerebral blood flow and motor behavior. NeuroImage 2021

S. Sagnier, G. Catheline, **F. Munsch**, *et al.*, Severity of Small Vessel Disease Biomarkers Reduces the Magnitude of Cognitive Recovery after Ischemic Stroke. *Cerebrovasc Dis.* 2021

M. Taso, **F. Munsch**, *et al.*, Regional and depth-dependence of cortical blood-flow assessed with high-resolution Arterial Spin Labeling (ASL). *J Cereb Blood Flow Metab.* 2021

J. Coutureau, J. Asselineau, P. Perez, G. Kuchcinski, S. Sagnier, P. Renou, **F. Munsch**, *et al.*, Cerebral Small Vessel Disease MRI features Do Not Improve the Prediction of Stroke Outcome. *Neurology* 2021

F. Munsch, *et al.*, Characterization of the cortical myeloarchitecture with inhomogeneous magnetization transfer imaging (ihMT). *NeuroImage* 2020

F. Munsch*, M. Taso, *et al.*, Rotated spiral RARE for high spatial and temporal resolution volumetric arterial spin labeling acquisition. *NeuroImage* 2020

G. Varma, **F. Munsch**, *et al.*, Three-dimensional inhomogeneous magnetization transfer with rapid gradient echo (3D ihMTRAGE) imaging. *Magn Reson Med.* 2020

S. Sagnier, G. Catheline, B. Dilharreguy, P.A. Linck, P. Coupé, **F. Munsch**, *et al.*, Normal-Appearing White Matter Integrity Is a Predictor of Outcome After Ischemic Stroke. *Stroke* 2020

A. Olivier, O. Moal, B. Moal, **F. Munsch**, *et al.*, Active learning strategy and hybrid training for infarct segmentation on diffusion MRI with a U-shaped network. *J Med Imaging (Bellingham)* 2019

S. Sagnier, G. Okubo, G. Catheline, **F. Munsch**, *et al.*, Chronic Cortical Cerebral Microinfarcts Slow Down Cognitive Recovery After Acute Ischemic Stroke. *Stroke* 2019

P.A. Linck, G. Kuchcinski, **F. Munsch**, *et al.*, Neurodegeneration of the Substantia Nigra after Ipsilateral Infarct: MRI R2* Mapping and Relationship to Clinical Outcome. *Radiology* 2019

S. Sagnier, **F. Munsch**, *et al.*, The Influence of Stroke Location on Cognitive and Mood Impairment. A Voxel-Based Lesion-Symptom Mapping Study. *J Stroke Cerebrovasc Dis.* 2019

V. Planche, **F. Munsch**, *et al.,* Anatomical predictors of cognitive decline after subthalamic stimulation in Parkinson's disease. *Brain Struct Funct.* 2018

A. Moroso, A. Ruet, D. Lamargue-Hamel, **F. Munsch**, *et al.,* Preliminary evidence of the cerebellar role on cognitive performances in clinically isolated syndrome. *J Neurol Sci.* 2018

B. Glize, A. Bigourdan, M. Villain, **F. Munsch**, *et al.,* Motor evoked potential of upper-limbs is predictive of aphasia recovery. *Aphasiology* 2018

G. Kuchcinski, **F. Munsch**, *et al.,* Thalamic alterations remote to a stroke appear as focal iron accumulation and impact clinical outcome. *Brain* 2017

S. Sagnier, G. Catheline, B. Dilharreguy, **F. Munsch**, *et al.,* Admission brain cortical volume: an independent determinant of poststroke cognitive vulnerability. *Stroke* 2017

S. Sagnier, P. Renou, S. Olindo, S. Debruxelles, M. Poli, F. Rouanet, **F. Munsch**, *et al.,* Gait change is associated with cognitive outcome after an acute ischemic stroke. *Front Aging Neurosci.* 2017

A. Moroso, A. Ruet, D. Lamargue-Hamel, **F. Munsch**, *et al.,* Microstructural analyses of the posterior cerebellar lobules in relapsing-onset multiple sclerosis and their implication in cognitive impairment. *PLoS One* 2017

N. Boddaert, A. Salvador, M.O. Chandesris, H. Lemaître, D. Grévent, C. Gauthier, O. Naggara, S. Georgin-Lavialle, DS Moura, **F. Munsch**, *et al.,* Neuroimaging evidence of brain abnormalities in mastocytosis. *Transl Psychiatry* 2017

F. Munsch*, S. Sagnier*, *et al.*, Stroke location is an independent predictor of cognitive outcome. *Stroke* 2016

A. Bigourdan*, **F. Munsch***, *et al.,* Early fiber number ratio is a surrogate of corticospinal tract integrity and predicts long-term motor recovery. *Stroke* 2016

A. Moroso, A. Ruet, D. Lamargue-Hamel, **F. Munsch**, *et al.,* Posterior lobules of the cerebellum and information processing speed at various stages of multiple sclerosis. *J Neurol Neurosurg Psychiatry.* 2016

V. Planche, A. Ruet, P. Coupé, Lamargue-Hamel, M. Deloire, B. Pereira, J.V. Manjon, **F. Munsch**, *et al.,* Hippocampal microstructural damage correlates with memory impairment in clinically isolated syndrome suggestive of multiple sclerosis. *Mult Scler.* 2016

L. Tellouck, M. Durieux, P. Coupé, A. Cougnard-Grégoire, J. Tellouck, T. Tourdias, **F. Munsch**, *et al.,* Optic radiations microstructural changes in glaucoma and association with severity: a study using 3Tesla-magnetic resonance diffusion tensor imaging. *Invest Ophtalmol Vis Sci.* 2016

Oral communications

European Society for Magnetic Resonance in Medicine 2024, 40th annual scientific meeting, 2-5 October2024, Barcelona

F. Munsch, D. Planes, H. Fukutomi, T. Courret, E. Micard, B. Chen, P. Seners, G. Marnat, V. Planche, P. Coupé, V. Dousset, B. Lapergue, JM. Olivot, I. Sibon, M. Thiebault de Schotten, T. Tourdias, on behalf of the FRAME and ETIS investigators. « Dynamic evolution of infarct volumes at MRI in ischemic stroke due to large vessel occlusion » || **ESMRMB 2024 Outstanding Abstract Award on the category "Segmentation & Image analysis"**

International Society for Magnetic Resonance in Medicine, 2024 Annual Meeting & Exhibition, 4-9 May 2024, Singapore

F. Munsch, D. Planes, H. Fukutomi, T. Courret, E. Micard, B. Chen, P. Seners, G. Marnat, V. Planche, P. Coupé, V. Dousset, B. Lapergue, JM. Olivot, I. Sibon, M. Thiebault de Schotten, T. Tourdias, on behalf of the FRAME and ETIS investigators. « Dynamic evolution of infarct volumes at MRI in ischemic stroke due to large vessel occlusion »

International Society for Magnetic Resonance in Medicine, 27th Annual Meeting & Exhibition, 11-16 May 2019, Montreal

F. Munsch, G, Varma, M. Taso, O.M. Girard, A. Guidon, G. Duhamel, D.C. Alsop. « Myeloarchitectonic mapping of cortical gray matter with 3D inhomogeneous magnetization transfer (ihMT) » || ***ISMRM Summa Cum Laude Merit Award***

International Stroke Conference, 24-26 January 2018, Los Angeles

F. Munsch, I. Sibon, V. Dousset, T. Tourdias, G. Schlaug. « Motor tract impairment is an independent predictor of lower extremity motor outcome »

French Society of Neuroradiology 43rd Annual Meeting, 30 March - 1st April 2016, Paris

F. Munsch, S. Sagnier, J. Asselineau, A. Bigourdan, V. Dousset, I Sibon, T. Tourdias. « Stroke location is an independent predictor of cognitive outcome »

French Neuro Vascular Society 20th Annual Meeting, 25-27 November 2015, Paris

F. Munsch, S. Sagnier, J. Asselineau, A. Bigourdan, V. Dousset, T. Tourdias, I Sibon. « Stroke location is an independent predictor of cognitive outcome » || ***Prize for best oral communication***

Poster communication

International Society for Magnetic Resonance in Medicine, 2023 Annual Meeting & Exhibition, 3-8 June 2023, Toronto

F. Munsch, M. Taso, D.H. Wolf, D. Press, S. Buss, J.A. Detre, D.C. Alsop. « Increased BOLD resting state fluctuation amplitude following upregulation of inhibitory activity with the GABA agonist alprazolam »

Organization of Human Brain Mapping 2022 Annual Meeting, June 19 – 23, Glasgow & virtual

F. Munsch, M. Taso, D.H. Wolf, D. Press, S. Buss, J.A. Detre, D.C. Alsop. « Pharmacological magnetic resonance imaging: BOLD and ASL provide complementary results »

Organization of Human Brain Mapping 2021 Annual Meeting, June 21 – 25, virtual

F. Munsch, M. Taso, D.C. Alsop. « Designs of resting ASL analyses in pharmacologic studies »

International Society for Magnetic Resonance in Medicine, 28th Annual Meeting & Exhibition, 08-14 August 2020, virtual

F. Munsch, M. Taso, J. Detre, D.C. Alsop. « Connectivity analyses of accelerated 3D resting-state ASL »

F. Munsch, G. Varma, M. Taso, S. Tauhid, O.M. Girard, G. Duhamel, R. Bakshi, D.C. Alsop. « Changes of cortical gray matter myelin and microstructure in multiple sclerosis (MS) assessed with quantitative ihMT and MT »

Organization of Human Brain Mapping 2020 Annual Meeting, June 23 – July 3rd, virtual

F. Munsch, M. Taso, L. Zhao, R.M. Lebel, A. Guidon. J. Detre. D.C. Alsop. « Rotated Stack of Spirals 3D RARE for Single-shot Volumetric ASL Acquisition and Resting-State Analyses »

F. Munsch, G. Varma, M. Taso, S. Tauhid, O.M. Girard, G. Duhamel, R. Bakshi, D.C. Alsop. « Assessment of cortical gray matter myelin and microstructure with quantitative inhomogeneous magnetization transfer »

International Society for Magnetic Resonance in Medicine, 27th Annual Meeting & Exhibition, 11-16 May 2019, Montreal

F. Munsch, M. Taso. L. Zhao, R.M. Lebel, A. Guidon. D.C. Alsop. « Rotated Stack of Spirals 3D RARE for Single-shot Volumetric ASL Acquisition »

The Neurosciences and Music - VI - Music, Sound and Health, 15-18 June 2017, Boston

F. Munsch, A. Norton, S. Paquette, X. Zheng, S. Marchina, G. Schlaug. « Intensive intonation-based therapy induces white matter changes in chronic stroke patients with Broca's aphasia »

Languages

English Fluent || TOEIC (score of 890) obtained in 2011

Spanish High school notions

Other information

Sports Cycling, handball (player and coach)

Culture History of Ancient Egypt and Classical Antiquity (Books, museums, journeys to Italy and Turkey, classical language courses)