Capucine Cadin

PhD Candidate in Neuroscience

Biomedical engineer | PhD candidate — Multimodal MRI biomarkers for glioma characterization.

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Education & Work experience

March 2023 — **Ph.D. Student | Magnetic Resonance Biomarkers for the Diagnosis and Monitoring of Brain Tumors**
Paris Brain Institute, ED3C, Sorbonne University Paris, France

- Multimodal MRI analysis of glioma subtypes (MRS, DW-MRS, dMRI, APT-CEST).
- Digital histology analysis and segmentation (H&E, Ki67, MBP, AQP4, CD56) for correlation with imaging biomarkers.
- Quantification of metabolic biomarkers (2HG, cystathionine) for molecular status prediction.
- Development of automated spectroscopy processing pipelines and ML classifiers.
- Longitudinal analysis of patient cohorts pre- post-surgery and during treatment.
- Design and implementation of a web-based platform for automated, standardized MRS analysis and interpretation (temporary link : https://specflow.icm-institute.org/)

From January 2024 to June 2025 — **Teacher Assistant | Introduction to Cognitive Neuroscience**
University of Paris-Cité - Institute of Psychology - Boulogne Site Paris, France

From 2019 to February 2023 — **MEng in Medical Biology Engineering**
Technological University of Compiegne (UTC) Compiègne, France

- GPA: 4.2/5.0 (top 10%).
- Specialization : Molecular Biology, Signal Processing, Image processing.

From September 2022 to February 2023 — **Master's Thesis | Multimodal Neuroimaging & Histology analysis (GBM & Parkinson's disease)**
Paris Brain Institute Paris, France

- Conducted *in vivo* experiments in GBM mouse models.
- Prepared histological brain sections (mouse and rat; Parkinson's and GBM models).
- Performed routine and specialized histological stainings.
- Conducted immunohistochemistry (PDL1/ anti-PDL1, neuromelanin; Immunofluorescence and bright-field).
- Acquired microscopy images for digital archiving and analysis.

From September 2020 to February 2021 — **R&D Engineering Intern | Image Processing, Deep Learning**
Laboratoire Traitement du Signal de l'Image (LTSI), INSERM Rennes, France

- ML architecture and loss functions computer coding (Python, Bash, R).
- Implemented and trained ML methods (U-Net, GAN, Pix2Pix, ANN) on MRI and CT cohorts.
- Generation of synthetic CT images (pseudo-CT, pCT) from MRI images with the Pix2Pix model.
- CT and MRI image processing.
- Evaluation of different metrics (PSNR, MAE, ME) on the obtained pCTs and comparison with the literature.

From 2016 to 2019 — **Preparatory class for the grandes écoles (PCSI/PC)**
Pôle Supérieur Assomption Bellevue Lyon, France

2016 — **Scientific Baccalauréat, European section**
Antoine de Saint Exupéry High School Lyon, France

Computer skills

- Python (Keras, Pytorch), Matlab, R, HTML, CSS, Javascript.
- Linux, Windows, Microsoft Office.
- Softwares: ITK-Snap, QuPath, LCModel.
- Toolboxes: FSL, MRTrix3, TractSeg.

Languages

- Fluent: French, English.
- Intermediate: Spanish, Japanese.

Laboratory skills

- Cutting tissue techniques (cryostat, vibratome, paraffin microtome).
- Immunohistochemistry.
- MRI, microscopes, and digital slide scanners.

Interests

- Philosophy, Psychology, Literature, Astrophysics.
- Writing, Traveling, Video editing.
- Tennis, Swimming.

Publications

Keywords : MRS, MEGA-PRESS, ML, APTw, NOEw, Glioma, 2HG, IDH, Cystathionine, 1p/19q codeletion, Parkinson

- **Cadin, C.**, et al. 2026 'Fluid-suppressed APTw and NOEw MRI as protein-related biomarkers for differentiating IDH and 1p/19q status in gliomas'. *(submitted)*
  Contribution : Acquisition, data and statistical analysis.
- **Cadin, C.**, et al. 2026 'Multicenter ensemble classifier for IDH mutation and 1p/19q codeletion predictions in gliomas using in vivo MR spectroscopy'. *(submitted)*
  Contribution : Acquisition, code implementation, data, ML and statistical analysis.
- Nichelli, L., **Cadin, C.**, et al. 2024. 'Incorporation of Edited MRS into Clinical Practice May Improve Care of Patients with IDH-Mutant Glioma'. ***American Journal of Neuroradiology*** 46 (July): ajnr.A8413.
  DOI : https://doi.org/10.3174/ajnr.A8413
  Contribution : Data analysis.
- Pérot JB., Ruze A., Gaurav R., Rebbah S., **Cadin C.**, et al. Longitudinal neuromelanin changes in prodromal and early Parkinson's disease in humans and rat model. ***Brain Communications***. 2025;7(3):fcaf204.
  DOI: https://doi.org/10.1093/braincomms/fcaf204
  Contribution : histological sample preparation, stainings, digital segmentation, preliminary statistical analyses.

Keywords : Radiation therapy, ML, CT, MRI, Deep Learning

- Tahri, S., **Cadin, C.**, et al. 2021. ***Radiotherapy and Oncology*** 161: S1401-2.
  DOI: https://doi.org/10.1016/S0167-8140(21)08128-7
- Tahri, S., Barateau, A., **Cadin, C.**, et al. 2022. ***Physica Medica*** 103: 108-18.
  DOI: https://www.sciencedirect.com/science/article/pii/S1120179722020646?dgcid=coauthor
  Contribution : Code implementation and data analysis.

- Chourak, H., Barateau, A., **Cadin, C.**, et al. 2021. ***Radiotherapy and Oncology*** 161: S1408-10.
  DOI: https://doi.org/10.1016/S0167-8140(21)08134-2
- Chourak, H., Barateau, A., Tahri, S., **Cadin, C.**, et al. 2022. ***Frontiers in Oncology*** 12.
  DOI: https://doi.org/10.3389/fonc.2022.968689
  Contribution : Statistical analysis.

Conferences

OHBM 2026 - Digital Poster (14-18 June, Bordeaux)

- Longitudinal tract-specific diffusion and spectroscopic changes in glioma under vorasidenib (1st author)

ISMRM 2026 - PowerPitch Oral + Digital Poster + Stipend (9-14 May, Cape Town)

- Longitudinal metabolic and microstructural changes in low-grade gliomas treated with vorasidenib (1st author)

CURE-ND 2026 - Oral (9-11 March, London)

- Longitudinal tract-specific diffusion and spectroscopic changes in glioma under vorasidenib (1st author)

ESMRMB 2025 - Oral + Lightening Talk + Stipend (8-11 October, Marseille)

- Oral: Brain Connectivity, Structure, and Biomarkers - PG029 Exploring intracellular environment in low-grade gliomas by diffusion-weighted MRS and APTw imaging at 3T. (1st author)
- LT: Translational MRI: from metabolism to therapy - PG104 A multicenter classifier of IDH status in gliomas based on in vivo spectroscopy metabolic biomarkers. (1st author)
  https://virtuel-esmrmb2025.mycongressonline.net/speaker/c02b72f2-43dd-96af-2f7f-682560704b3a/CADIN-Capucine

ISMRM 2025 - 2 Digital posters (10-15 May, Hawaï)

- Exploring intracellular environment in low-grade gliomas by diffusion-weighted MRS and APTw imaging at 3T, (1st author) : https://archive.ismrm.org/2025/2926.html
- Noninvasive glioma stratification by multiparametric metabolic and microstructural MRI at 3T, (1st author) : https://archive.ismrm.org/2025/2397_CSNAvTRTI.html

SFRMBM 2025 - Oral + Poster + Stipend (24-26 March, Saint-Malo)

- Oral: Noninvasive glioma stratification by multiparametric metabolic and microstructural MRI at 3T (1st author) : https://www.canal-u.tv/chaines/sfrmbm/spectroscopie-par-irm/stratification-non-invasive-des-gliomes-par-irm
- Poster: Exploring intracellular environment in low-grade gliomas by diffusion-weighted MRS and APTw imaging at 3T (1st author)

CURE-ND 2025 - Oral (19-21 March, Paris)

- Noninvasive glioma stratification by multiparametric metabolic and microstructural MRI at 3T (1st author)

ISMRM 2024 - Digital Poster (4-9 May, Singapore)

- Metabolic biomarkers of IDH status in gliomas by in vivo Magnetic Resonance Spectroscopy (1st author)
  https://archive.ismrm.org/2024/1834.html