

Maité Crespo García

Research Associate

MRC Cognition and Brain Sciences Unit

University of Cambridge

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~ Professional Profile

I am a cognitive neuroscientist and Research Associate at the MRC Cognition and Brain Sciences Unit, University of Cambridge, where I am a member of the Cambridge Centre for Ageing and Neuroscience (Cam-CAN) and previously worked in the Memory Control Laboratory. My research investigates the neural mechanisms underlying memory and cognition across the lifespan, with a particular focus on episodic memory, inhibitory control, and healthy cognitive ageing.

My work combines behavioural experimentation with multimodal neuroimaging, including EEG, MEG, intracranial EEG, fMRI, and transcranial magnetic stimulation (TMS), and advanced computational approaches to investigate the neural dynamics and large-scale brain networks supporting memory and the suppression of unwanted thoughts.

My long-term research aims to identify the neural mechanisms that promote healthy cognitive ageing and the adaptive regulation of memory and thought, with the goal of advancing cognitive resilience and mental well-being. Alongside my research, I am committed to teaching, mentoring, and developing open, reproducible computational approaches for cognitive neuroscience.

~ Academic Appointments

Research Associate

2025–present

Cambridge Centre for Ageing and Neuroscience (Cam-CAN), MRC Cognition and Brain Sciences Unit, University of Cambridge, UK

Investigating longitudinal age-related changes in resting-state MEG activity, focusing on oscillatory and aperiodic components of the power spectrum.

Research Associate

2021–2025

Memory Control Laboratory, MRC Cognition and Brain Sciences Unit, University of Cambridge, UK

Investigated the neural mechanisms underlying inhibitory control of memory using behavioural paradigms, EEG, fMRI, and repetitive TMS. Main projects investigated the medial septum pacemaker suppression hypothesis using simultaneous EEG-fMRI and memory suppression paradigms, and the modulation of prefrontal mechanisms involved in retrieval suppression using non-invasive brain stimulation.

Research Associate

2020–2021

Department of Psychology, University of Cambridge, UK

Investigated the behavioural and neurochemical mechanisms underlying goal-directed behaviour and compulsivity in obsessive-compulsive disorder. Contributed to projects investigating neurochemical alterations in the anterior cingulate cortex and their relationship with impulse control and midline evoked potentials.

Newton International Fellow 2017–2019
Memory Control Laboratory, MRC Cognition and Brain Sciences Unit, University of Cambridge, UK
Investigated the neural mechanisms of retrieval suppression and memory control using simultaneous EEG-fMRI. Focused on frontal-midline theta and N2 activity associated with the dorsal anterior cingulate cortex's role in detecting and signalling the need for executive control.

Marie Skłodowska-Curie / Zukunftskolleg Postdoctoral Fellow 2013–2016
Neuroelectromagnetic Oscillations Laboratory (NEMOlab), University of Konstanz, Germany
Investigated hippocampal dynamics supporting episodic memory and spatial navigation using MEG with beamformer source localisation, intracranial EEG, and simultaneous MEG–intracranial EEG recordings in patients with epilepsy.

~ Education

PhD in Physiology and Neuroscience 2013
Pablo de Olavide University, Seville, Spain
Dissertation: *Effects of Aging on the Cortical Dynamics Underlying the Formation of Associative Memory* (awarded *Cum Laude*).

Master of Advanced Studies (Diploma de Estudios Avanzados) in Physiology and Neuroscience 2007
University of Seville, Spain
Thesis: *Comparison of ICA Algorithms Applied to Artifact Removal from Sleep EEG Recordings* (awarded *Outstanding*).

BSc in Biochemistry 2004
University of Seville, Spain

~ Competitive Research Funding

Newton International Fellowship (Royal Society, UK) 2017–2019
Hosted by the University of Cambridge (Host: Professor Michael C. Anderson)
Voluntary Suppression of Unwanted Memories: The Medial Septal Pacemaker Hypothesis
£99,000

German Research Foundation (DFG) Research Fellowship 2017
(awarded, declined)

Marie Skłodowska-Curie / Zukunftskolleg Postdoctoral Fellowship 2014–2016
Hosted by the University of Konstanz, Germany (Host: Professor Sarang S. Dalal)
Human Cortico-Hippocampal Interactions during the Encoding of New Object-Place Associations Supported by Spatial and Semantic Schemas

Zukunftskolleg Research Funding 2014–2016
Associated with the Marie Skłodowska-Curie / Zukunftskolleg Fellowship
Competitive funding for research expenses, equipment, and student assistance.

~ Awards & Honours

Postdoctoral Fellow Award <i>Cognitive Neuroscience Society (CNS) Annual Meeting, San Francisco, USA</i>	2022
Competitive award recognizing outstanding postdoctoral researchers in cognitive neuroscience; included stipend support for conference and travel expenses.	
Best Poster Award – First Prize <i>VII Meeting of the Spanish Network on Cognitive Neuroscience (RNCC), Seville, Spain</i>	2011
Best Poster Award – Runner-up <i>11th International Conference on Cognitive Neuroscience (ICON), Mallorca, Spain</i>	2011
Best Poster Award – First Prize <i>V Meeting of the Spanish Network on Cognitive Neuroscience (RNCC), Barcelona, Spain</i>	2009
Best Poster Award – Second Prize <i>V Meeting of the Spanish Network on Cognitive Neuroscience (RNCC), Barcelona, Spain</i>	2009

~ Research in Progress

- Crespo-García, M.**, Apšvalka, D., Lei, X., Jiang, M., Wang, Y., & Anderson, M. C. *Inhibitory control of hippocampal activity by the prefrontal cortex achieved by medial septal pacemaker suppression.*
- Crespo-García, M.**, Khan, A., Karvat, G., & Anderson, M. C. *Hippocampal modulation with TMS.*
- Healy, M., **Crespo-García, M.**, Lee, L. Y., Biria, M., Frota Lisboa Pereira de Souza, A. M., Banca, P., Kourtzi, Z., & Robbins, T. W. *Interplay of neurochemical and functional brain mechanisms underpinning goal-directed vs. habitual behaviour in obsessive compulsive disorder.*
- Healy, M., Frota Lisboa Pereira de Souza, A. M., **Crespo-García, M.**, Biria, M., Banca, P., & Robbins, T. W. *Deciphering compulsivity: Unveiling behavioural traits and predictive patterns through data-driven inquiry.*
- Kirpalani, M., Nardo, D., **Crespo-García, M.**, Apšvalka, D., Zikopoulos, B., & Anderson, M. C. *Prefrontal-thalamic pathways underlying inhibitory control over the hippocampus: The role of the nucleus reuniens.*

~ Publications

Manuscripts in Preparation

Frota Lisboa Pereira de Souza, A. M., Biria, M., Banca, P., Guedes de Nonohay, R., Apšvalka, D., **Crespo-García, M.**, Hellerstedt, R., Keser, E., Healy, M., Sule, A., Bekinschtein, T. A., Fineberg, N. A., & Robbins, T. W. (2026). *Evoked potential activity in obsessive-compulsive disorder (OCD) relates to neurochemical imbalance in the anterior cingulate cortex and measures of impulse control.*

Preprints

Crespo-García, M., Apsvalka, D., Demetriou, I., Attaheri, A., Emery, T., Aller, M., & Henson, R. (2026). *Longitudinal versus cross-sectional effects of age on MEG power spectra parameters: Implications for normative models and brain ageing.* [bioRxiv preprint].
DOI: [10.64898/2026.06.01.729181v1](https://doi.org/10.64898/2026.06.01.729181v1).

Peer-reviewed Publications

- Demetriou, I., Attaheri, A., Bingham, T., Duckett, W., Bridge, L., Raykov, P., Tsvetanov, K. A., Correia, M. M., Apšvalka, D., **Crespo-García, M.**, Campbell, K., Morcom, A., Mitchell, D. J., Rowe, J., Wolpe, N., Henderson, S. E., Cam-CAN, & Henson, R. (2026). The Cambridge Centre for Ageing and Neuroscience (Cam-CAN) longitudinal study protocol: Phase 4 (“Enrichment”) and Phase 5 (“Rescan”). *Explor Neurosci*, 5, 1006138.
DOI: [10.37349/en.2026.1006138](https://doi.org/10.37349/en.2026.1006138).
- Karvat, G., **Crespo-García, M.**, Vishne, G., Anderson, M. C., & Landau, A. N. (2026). Universal rhythmic architecture uncovers two modes of neural dynamics. *Nat Commun*.
DOI: [10.1038/s41467-026-73553-8](https://doi.org/10.1038/s41467-026-73553-8).
- Anderson, M. C., **Crespo-García, M.**, & Subbulakshmi, S. (2025). Brain mechanisms underlying the inhibitory control of thought. *Nat Rev Neurosci*, 26(7), 415–437.
DOI: [10.1038/s41583-025-00929-y](https://doi.org/10.1038/s41583-025-00929-y).
- Khan, A., Liu, J., **Crespo-García, M.**, Yuan, K., Hu, C.-P., Ren, Z., Ti, C.-H. E., Oathes, D. J., & Tong, R. K.-Y. (2025). From correlation to causation: Understanding episodic memory networks. *Neurosci Bull*, 41(8), 1463–1486.
DOI: [10.1007/s12264-025-01407-2](https://doi.org/10.1007/s12264-025-01407-2).
- Khan, A., Ti, C. H. E., Yuan, K., **Crespo-García, M.**, Anderson, M. C., & Tong, R. K.-Y. (2024). Medial prefrontal cortex stimulation reduces retrieval-Induced forgetting via fronto-parietal beta desynchronization. *J Neurosci*, 44(37).
DOI: [10.1523/JNEUROSCI.0189-24.2024](https://doi.org/10.1523/JNEUROSCI.0189-24.2024).
- Crespo-García, M.**, Wang, Y., Jiang, M., Anderson, M. C., & Lei, X. (2022). Anterior cingulate cortex signals the need to control intrusive thoughts during motivated forgetting. *J Neurosci*, 42(21), 4342–4359.
DOI: [10.1523/JNEUROSCI.1711-21.2022](https://doi.org/10.1523/JNEUROSCI.1711-21.2022).
- Ruzich, E., **Crespo-García, M.**, Dalal, S. S., & Schneiderman, J. F. (2019). Characterizing hippocampal dynamics with MEG: A systematic review and evidence-based guidelines. *Hum Brain Mapp*, 40(4), 1353–1375.
DOI: [10.1002/hbm.24445](https://doi.org/10.1002/hbm.24445).
- Clausner, T., Dalal, S. S., & **Crespo-García, M.** (2017). Photogrammetry-based head digitization for rapid and accurate localization of EEG electrodes and MEG fiducial markers using a single digital SLR camera. *Front Neurosci*, 11, 264.
DOI: [10.3389/fnins.2017.00264](https://doi.org/10.3389/fnins.2017.00264).
- Crespo-García, M.**, Zeiller, M., Leupold, C., Kreiselmeier, G., Rampp, S., Hamer, H. M., & Dalal, S. S. (2016). Slow-theta power decreases during item-place encoding predict spatial accuracy of subsequent context recall. *Neuroimage*, 142, 533–543.
DOI: [10.1016/j.neuroimage.2016.08.021](https://doi.org/10.1016/j.neuroimage.2016.08.021).
- Crespo-García, M.**, & Hartmann, T. (2014). Does illusory flickering result from rhythmic sampling of visual stimuli? *J Neurosci*, 34(2), 343–345.
DOI: [10.1523/JNEUROSCI.4486-13.2014](https://doi.org/10.1523/JNEUROSCI.4486-13.2014).
- Crespo-García, M.**, Pinal, D., Cantero, J. L., Díaz, F., Zurrón, M., & Atienza, M. (2013). Working memory processes are mediated by local and long-range synchronization of alpha oscillations. *J Cogn Neurosci*, 25(8), 1343–1357.
DOI: [10.1162/jocn_a_00379](https://doi.org/10.1162/jocn_a_00379).
- Crespo-García, M.**, Cantero, J. L., & Atienza, M. (2012). Effects of semantic relatedness on age-related associative memory deficits: The role of theta oscillations. *Neuroimage*, 61(4), 1235–1248.
DOI: [10.1016/j.neuroimage.2012.03.034](https://doi.org/10.1016/j.neuroimage.2012.03.034).
- Atienza, M., **Crespo-García, M.**, & Cantero, J. L. (2011). Semantic congruence enhances memory of episodic associations: Role of theta oscillations. *J Cogn Neurosci*, 23(1), 75–90.
DOI: [10.1162/jocn.2009.21358](https://doi.org/10.1162/jocn.2009.21358).
- Gollo, L. L., Mirasso, C. R., Atienza, M., **Crespo-García, M.**, & Cantero, J. L. (2011). Theta band zero-lag long-range cortical synchronization via hippocampal dynamical relaying. *PLoS One*, 6(3), e17756.
DOI: [10.1371/journal.pone.0017756](https://doi.org/10.1371/journal.pone.0017756).

Crespo-García, M., Cantero, J. L., Pomyalov, A., Boccaletti, S., & Atienza, M. (2010). Functional neural networks underlying semantic encoding of associative memories. *Neuroimage*, 50(3), 1258–1270.
DOI: [10.1016/j.neuroimage.2010.01.018](https://doi.org/10.1016/j.neuroimage.2010.01.018).

Crespo-García, M., Atienza, M., & Cantero, J. L. (2008). Muscle artifact removal from human sleep EEG by using independent component analysis. *Ann Biomed Eng*, 36(3), 467–475.
DOI: [10.1007/s10439-008-9442-y](https://doi.org/10.1007/s10439-008-9442-y).

~ Research Software

Longitudinal MEG Power Spectra Analysis Workflow

Open-source code accompanying Crespo-García et al. (2026), providing a reproducible analysis workflow for preprocessing, spectral power estimation, spectral parameterisation, statistical modelling, permutation testing, and figure generation.

[GitHub repository](#)

LAVI (Python implementation)

Open-source Python implementation of the original MATLAB LAVI toolbox for longitudinal neuroimaging analyses, developed as part of the official open-source LAVI project.

[GitHub repository](#)

~ Teaching and Supervision

University Teaching

Guest Lecturer, Cambridge Research Methods

2024

University of Cambridge, UK

Designed and delivered the postgraduate module *Advanced Topics in Data Preparation Using Python* (4 weeks, 8 hours), covering data handling strategies and workflows for scientific research.

Invited Lecturer, Summer Courses in Carmona

2011

Pablo de Olavide University, Spain

Delivered a lecture on Methods for *Source Localisation of Brain Activity* as part of the course *Techniques of Mathematical and Computational Analyses in Human Neurophysiology*.

Student Supervision

Supervision and mentoring of undergraduate, Master's and PhD students at the University of Pablo de Olavide, the University of Konstanz, and the University of Cambridge. Guidance provided in EEG and fMRI data preprocessing and analysis, statistical analysis of neuroimaging and behavioural data, experimental design and data collection, scientific figures preparation, paper writing, and oral presentations.

~ Professional Service

Peer Review

Regular reviewer for leading international journals, including *npj Science of Learning*, *Nature Human Behaviour*, *Nature Communications*, *Brain*, *Journal of Neuroscience*, *NeuroImage*, *Cerebral Cortex*, *Human Brain Mapping*, *eLife*, *PLOS Biology*, and *Neuroscience & Biobehavioral Reviews*.

Professional Memberships

Current member of the Sociedad Española de Psicofisiología y Neurociencia Cognitiva y Afectiva (SEPNECA).

~ Technical Expertise

Neuroimaging

EEG & MEG

Event-related potentials, independent component analysis (ICA), time-frequency analyses, source localisation (beamformers), realistic forward modelling, functional and effective connectivity analyses.

MRI/fMRI

Univariate and ROI analyses, EEG-informed fMRI, canonical correlation analyses, dynamic causal modelling, voxel-based morphometry, manual hippocampal segmentation (ITK-SNAP), development of subject-specific nucleus reuniens ROIs.

TMS

Neuronavigated TMS, TMS-EEG acquisition, motor threshold determination, online task-triggered stimulation protocols, rhythmic and arrhythmic stimulation, TMS artefact correction.

Experimental Research

Task Design

Design and implementation of behavioural paradigms for MEG, intracranial EEG, fMRI, TMS-EEG and online studies.

Data Collection

Extensive experience acquiring behavioural, EEG, MEG, intracranial EEG, fMRI and TMS-EEG datasets from healthy participants, older adults, patients with mild cognitive impairment (MCI), obsessive-compulsive disorder (OCD), and epilepsy.

Computational Methods

Programming

MATLAB, Python, R.

Experimental Software

Unity3D, Psychtoolbox, Cogent2000, jsPsych, Cognition, Pavlovia, Prolific.

Neuroimaging Software

MNE-Python, SPM12, FieldTrip, EEGLAB, BESA, BrainVision Analyzer/Recorder, OpenMEEG.

Statistical & Visualisation Software

MRICro/N, ITK-SNAP, WFU PickAtlas, Anatomy Toolbox, Connectome Workbench, 3D Slicer, PLScmd, Robust Correlation Toolbox, SPSS.

Artificial Intelligence & Data Science

Continuing professional development in applied artificial intelligence, machine learning, and data science, with a focus on their application to cognitive neuroscience research. Actively integrating AI-assisted tools into research workflows, including scientific programming, literature review, structured data extraction, software development, and scientific writing. Committed to developing efficient, transparent, and reproducible computational research practices, while expanding expertise in the application of AI and machine learning to neuroimaging data analysis.

Applied AI and Data Science Program

2026

MIT Professional Education & Great Learning

Fourteen-week professional programme covering supervised machine learning, decision trees, time-series analysis, neural networks, computer vision, recommendation systems, generative AI, prompt engineering, and practical AI applications.

[ePortfolio](#) (evaluated projects).

Accelerate Programme for Scientific Discovery

2025–2026

Department of Computer Science and Technology, University of Cambridge

Series of specialised workshops on AI methods for scientific research, including Packaging and Publishing Python Code for Research, Hands-on AI, Large Language Models, Generative AI, and Docker for reproducible computational workflows.

~ Languages

Spanish (*native*), English (*fluent*), German (*intermediate*).

~ Selected Oral Presentations

- **2021** – Anterior cingulate cortex signals the need for proactive and reactive control of intrusive thoughts during motivated forgetting. *Cambridge Memory Meeting, University of Cambridge, Cambridge, UK.*
- **2019** – Anterior cingulate cortex signals the need to control intrusive thoughts during motivated forgetting. *Kent Memory Workshop, University of Kent, Kent, UK.*
- **2017** – Theta power decreases predict spatial accuracy of subsequent active navigation: a combined intracranial EEG/MEG study. *First Nordic MEG conference (MEG Nord), Center of Functionally Integrative Neuroscience (CFIN), Aarhus University, Aarhus, Denmark.*
- **2017** – Theta power decreases predict spatial accuracy of subsequent active navigation: a combined intracranial EEG/MEG study. *13th International Conference on Cognitive Neuroscience (ICON), University of Amsterdam, Amsterdam, Netherlands.*

- **2016** – Application of a MEG-iEEG simultaneous recording helps to validate slow-theta power decreases during the encoding of item-place associations. *20th International Conference on Biomagnetism (BIOMAG)*, Seoul National University, Seoul, Korea.
- **2015** – Theta subsequent memory effects during the encoding of item-place and item-direction associations observed in a simultaneous MEG-iEEG recording. *International Conference on Basic and Clinical multimodal Imaging (BaCI)*, University Medical Center Utrecht, Utrecht, Netherlands.
- **2012** – Effects of semantic relatedness on age-related associative memory deficits: The role of theta-brain oscillations. *VIII Congress of the Spanish Society for Psychophysiology and Cognitive and Affective Neuroscience (SEPNECA)*, University of Barcelona, Barcelona, Spain.
- **2010** – Age-related benefits of semantic encoding of associative memories is manifested in power modulations of theta and alpha oscillations. *8th Spanish Experimental Psychological Society (SEPEX) Conference. 1st Joint Conference of the Experimental Psychology Society (EPS) and SEPEX*, University of Granada, Granada, Spain.

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