Cristina Alcacer, PhD

Neuroscientist · Parkinson's disease · AI-based behavioral analysis · Neurotechnology

Madrid, Spain · cristina.alcacer@cajal.csic.es · cristina.alcacer81@gmail.com
ORCID 0000-0003-2502-0983 · LinkedIn · Portfolio cristinaalcacer.github.io/portfolio

PROFILE

Neuroscientist with almost two decades of research on Parkinson's disease and L-DOPA-induced dyskinesia at four European institutions (Paris VI, Lund University, Champalimaud Foundation, CSIC). I now lead an AI-based behavioral analysis project in parkinsonian mice (Momentum, CSIC), aimed at turning movement data into tools that help patients.

Over €1.1M secured as PI or beneficiary (Marie Skłodowska-Curie, María Zambrano, Momentum), first- and corresponding-author papers in *J Clin Invest* and *Cell Reports*, and recent training in innovation and technology transfer (Activa-T, InspiraTech).

CURRENT POSITION

Postdoctoral researcher, Momentum Programme (CSIC) · Jan 2025 – Dec 2028 · Cajal Neuroscience Center, CSIC, Madrid · Jercog lab

- Lead the project *Development and Implementation of AI for animal behavior and neuronal activity analysis and integration* (MRR-NextGenerationEU, MMT24-IC-01; €370,515).
- Build behavioral fingerprints of dopaminergic drugs and doses in parkinsonian mice, from pose estimation (DeepLabCut), wearable motion sensors and machine learning.
- Complete 240 ECTS of AI training required by the programme, complemented with training in innovation and technology transfer.

RESEARCH EXPERIENCE

María Zambrano postdoctoral fellow · 2022 – 2024 · University of Alcalá (UAH) and IRYCIS, Madrid · in collaboration with the Cajal Institute (CSIC)

- Won a María Zambrano talent-attraction grant as PI (€147,500) and led an interdisciplinary project on how retinal dopamine loss in a Parkinson's model affects retinal circuits and visual function (2 papers under review).
- Brought a parkinsonian model of retinal dopamine depletion into a retinal electrophysiology lab; at the Cajal Institute (Moratalla lab), set up fiber photometry, helped a PhD student set up in vivo electrophysiology and acted as project manager.
- Taught Human Physiology to 2nd-year Pharmacy students (UAH) and mentored Master's and PhD students.

Associate researcher / senior postdoctoral fellow · 2016 – 2021 · Champalimaud Foundation, Lisbon · Neurobiology of Action lab (R. M. Costa)

- Funded by a Marie Skłodowska-Curie International Career Grant as PI (€576,891; Lund University affiliation until 2019).
- Introduced Parkinson's and dyskinesia models in a movement-control lab; learned calcium imaging in freely moving mice and built a rotating platform with the hardware team.
- Combined head-mounted inertial sensors, video and machine learning to classify dyskinesia automatically, and linked each movement to specific striatal ensembles (*Cell Reports* 2025, co-first and corresponding author).
- Team member of an ERC Proof of Concept grant on behavior phenotyping with inertial sensors (€149,820) and of an industry collaboration with MediCane Health Inc. (€400,000).

Postdoctoral fellow / associate researcher · 2012 – 2015 · Lund University, Biomedical Center · Basal Ganglia Pathophysiology Unit (M. A. Cenci)

- Set up chemogenetics (DREADDs) in the lab and showed that dyskinesia can be modulated in both directions through the two striatal pathways (*J Clin Invest* 2017, first and corresponding author).

- Secured two Swedish foundation grants as PI (Crafoord Foundation; Lars Hierta Memorial Foundation).

EDUCATION

PhD in Neuroscience (Brain, Cognition, Behavior) · 2007 – 2011 · Université Pierre et Marie Curie (Paris VI) · Institut du Fer-à-Moulin, Girault lab, Paris

MSc in Biology · 2006 · University of Valencia

FUNDING AND AWARDS

Over €1.1M secured as PI or beneficiary, plus participation in an ERC Proof of Concept grant and an industry collaboration.

- **As PI:** Marie Skłodowska-Curie International Career Grant (2016–2019, €576,891) · María Zambrano (2022–2024, €147,500) · Marie Skłodowska-Curie Individual Fellowship (2016, €148,636; score 96.4%, declined for the Career Grant) · Crafoord Foundation (2016–2018, €20,000) · Lars Hierta Memorial Foundation (2014–2015, €3,000)
- **As beneficiary:** Momentum Programme, CSIC (2025–2028, €370,515)
- **As team member:** ERC Proof of Concept (2019–2020, €149,820) · MediCane Health Inc. industry collaboration (2020–2022, €400,000)

INNOVATION, ENTREPRENEURSHIP AND NEUROTECHNOLOGY TRAINING

- InspiraTech, FGCSIC · Fundación Bankinter (2026, ongoing)
- Valencia Neurotechnology Summer School, Universidad Católica de Valencia (June 2026)
- Activa-T, CSIC (May 2026)
- II Summer School of Neurotechnology "Rodríguez Delgado", UIMP Santander (June 2025, 2.5 ECTS)
- AI training within the Momentum Programme, CSIC (240 ECTS, 2025–2028)

PUBLICATIONS

h-index 10 · 1,773 citations (Google Scholar, Oct 2026) · 11 papers in Q1 journals (SJR, year of publication). * co-first author, † corresponding author.

1. **Alcacer C†**, Jercog PE. 2026. AI-based mouse behavior analysis in pathology: a focus on movement disorders. *Neuroscience & Biobehavioral Reviews*. Review. doi:10.1016/j.neubiorev.2026.106704
2. **Alcacer C*†**, Klaus A*, Mendonça M, Abalde SF, Cenci MA†, Costa RM†. 2025. Abnormal hyperactivity of specific striatal ensembles encodes distinct dyskinetic behaviors revealed by high-resolution clustering. *Cell Reports* 44(7):115988. doi:10.1016/j.celrep.2025.115988
3. **Alcacer C†**, Andreoli L, Sebastianutto I, Jakobsson J, Fieblinger T, Cenci MA†. 2017. Chemogenetic stimulation of striatal projection neurons modulates responses to Parkinson's disease therapy. *J Clin Invest* 127(2):720–734. doi:10.1172/JCI90132
4. Bastide MF*, Meissner WG*, Picconi B*, Fasano S*, Fernagut PO*, Feyder M*, Francardo V*, **Alcacer C***, Ding Y*, ..., Cenci MA, Bézard E. 2015. Pathophysiology of L-dopa-induced motor and non-motor complications in Parkinson's disease. *Prog Neurobiol* 132:96–168. Review. doi:10.1016/j.pneurobio.2015.07.002
5. Charbonnier-Beaupel F*, Malerbi M*, **Alcacer C***, Tahiri K, Carpentier W, Worley PF, Girault JA, Hervé D, Corvol JC. 2015. Gene expression analyses identify Narp contribution in the development of L-DOPA-induced dyskinesia. *J Neurosci* 35(1):96–111. doi:10.1523/JNEUROSCI.5231-13.2015
6. Fieblinger T, Graves SM, Sebel LE, **Alcacer C**, Plotkin JL, Gertler TS, Chan CS, Heiman M, Greengard P, Cenci MA, Surmeier DJ. 2014. Cell type-specific plasticity of striatal projection neurons in parkinsonism and L-DOPA-induced dyskinesia. *Nat Commun* 5:5316. doi:10.1038/ncomms6316
7. Fieblinger T, Sebastianutto I, **Alcacer C**, Bimpisidis Z, Maslava N, Sandberg S, Engblom D, Cenci MA. 2014. Mechanisms of dopamine D1 receptor-mediated ERK1/2 activation in the parkinsonian striatum and their modulation by metabotropic glutamate receptor type 5. *J Neurosci* 34(13):4728–4740. doi:10.1523/JNEUROSCI.2702-13.2014

8. **Alcacer C**, Charbonnier-Beaupel F, Corvol JC, Girault JA, Hervé D. 2014. Mitogen- and stress-activated protein kinase 1 is required for specific signaling responses in dopamine-denervated mouse striatum, but is not necessary for L-DOPA-induced dyskinesia. *Neurosci Lett* 583:76–80. doi:10.1016/j.neulet.2014.09.018
9. **Alcacer C**, Santini E, Valjent E, Gaven F, Girault JA, Hervé D. 2012. Gαolf mutation allows parsing the role of cAMP-dependent and ERK-dependent signaling in L-DOPA-induced dyskinesia. *J Neurosci* 32(17):5900–5910. doi:10.1523/JNEUROSCI.0837-12.2012
10. Gangarossa G, Di Benedetto M, O'Sullivan GJ, Dunleavy M, **Alcacer C**, Bonito-Oliva A, Henshall DC, Waddington JL, Valjent E, Fisone G. 2011. Convulsant doses of a dopamine D1 receptor agonist result in Erk-dependent increases in Zif268 and Arc/Arg3.1 expression in mouse dentate gyrus. *PLoS One* 6(5):e19415. doi:10.1371/journal.pone.0019415
11. Languille S, Davis S, Richer P, **Alcacer C**, Laroche S, Hars B. 2009. Extracellular signal-regulated kinase activation is required for consolidation and reconsolidation of memory at an early stage of ontogenesis. *Eur J Neurosci* 30(10):1923–1930. doi:10.1111/j.1460-9568.2009.06971.x
12. Santini E, **Alcacer C**, Cacciatore S, Heiman M, Hervé D, Greengard P, Girault JA, Valjent E, Fisone G. 2009. L-DOPA activates ERK signaling and phosphorylates histone H3 in the striatonigral medium spiny neurons of hemiparkinsonian mice. *J Neurochem* 108(3):621–633. doi:10.1111/j.1471-4159.2008.05831.x

BOOK CHAPTER

Alcacer C†, Francardo V, Cenci MA. 2016. Signaling mechanisms in L-DOPA-induced dyskinesia. In: *The Basal Ganglia: Novel Perspectives on Motor and Cognitive Functions*, Part II, Chapter 8, pp. 155–185. Springer International Publishing Switzerland. ISBN 978-3-319-42743-0. († co-corresponding author)

TECHNIQUES AND EXPERTISE

- **Behavior and AI:** markerless pose estimation (DeepLabCut), inertial measurement units (IMUs), machine learning for behavior (clustering, SVM, XGBoost), Python.
- **Recording and manipulating circuits:** chemogenetics (DREADDs), in vivo calcium imaging (miniscopes), fiber photometry; working knowledge of in vivo electrophysiology in anesthetized mice.
- **Disease models:** rodent models of Parkinson's disease and L-DOPA-induced dyskinesia, stereotaxic surgery, behavioral pharmacology.
- **Cellular and molecular:** immunohistochemistry, confocal microscopy, Western blot, gene expression analysis.
- **Project management:** grant writing and pre-/post-award management, team coordination, international collaborations.

TEACHING, SUPERVISION AND DISSEMINATION

- **Supervision:** mentored master's and PhD students and research assistants in Lund and Lisbon, including Laura Andreoli (now postdoc at UCL) and Sara F. Abalde (PhD at IIT).
- **Teaching:** Human Physiology, Pharmacy degree, University of Alcalá (30 h/year, 2022–2024); final-degree project (TFG) evaluation committee (2024).
- **Peer review:** *Movement Disorders*, *Experimental Neurology*, *Neuropharmacology*, *Neurobiology of Disease*, *Frontiers in Aging Neuroscience*, *Journal of Neuroscience Methods*.
- **Talks:** 15+ presentations at international conferences, including oral talks (Stockholm 2014, Portland 2016) and invited talks (MultiPark 2016, XIV Triennial Meeting of the International Basal Ganglia Society, IBAGS 2023).
- **Outreach:** JCI 2017 study covered by Lund University, ScienceDaily and MedicalXpress.

LANGUAGES

Spanish (native) · English (fluent) · French (fluent) · Portuguese (intermediate)