

CV Date	04/09/2023
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Part A. PERSONAL INFORMATION

First Name *	Pablo E.		
Family Name *	Jercog		
Sex *	Male	Date of Birth *	24/08/1976
ID number Social Security, Passport *	Y4046155D	Phone Number *	(+34) 915854705
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Email Address	pjercog@gmail.com		
Researcher's identification number	Open Researcher and Contributor ID (ORCID) *	0000-0001-7852-5884	
	Researcher ID	A-8973-2018	
	Scopus Author ID	8654687200	

* Mandatory

A.1. Current position

Job Title	Doctor Fuera de Convenio (Científico Titular en espera)		
Starting date	2023		
Institution	Consejo Superior de Investigaciones Científicas		
Department / Centre	Functional and systems neurobiology / Instituto Cajal		
Country		Phone Number	
Keywords	Natural sciences and health sciences		

A.2. Previous positions

Period	Job Title / Name of Employer / Country
2015 - 2023	Research Fellow R2C / Institut d'Investigacions Biomèdiques August Pi i Sunyer / Spain
2013 - 2015	Research Associate / Stanford University
2008 - 2013	Post-doctoral Fellow / Columbia University of the City of New York

A.3. Education

Degree/Master/PhD	University / Country	Year
PhD Biophysics	New York University	2008
PhD Neurosciences	New York University	2008
Masters Physics and Applied Mathematics	New York University	2005
Masters Physics	Universidad de Buenos Aires	2002

A.4. General quality indicators of scientific production

H-index: 7 (WOS 18/01/2023)

Número total de citas: 818 (google scholar)

Citado en últimos 5 años: 603 (google scholar)

Promedio de citas por cada artículo: 60.3

Part B. CV SUMMARY

I have been trained in theoretical physics, and in theoretical and experimental neuroscience. In my research, I study how information is encoded in the brain to better understand brain's computation.

- My 1st post-doctoral training was at Columbia U. under the mentorship of Eric Kandel (Nobel Prize 2000) and Larry Abbott and experimentally trained by Edvard and May-Britt Moser (Nobel Prize 2014). During this time, I discovered the existence of a multiplicative code

in the hippocampus, which allows different memories to co-exist in the same cell assembly without interference (Jercog et al. 2019). This work disrupts the paradigm that assumes that hippocampal neurons encode only one feature at a time, such as space, head-direction, reward, etc. I gained financial support from several private foundations: Mathers', Swarts & Italian Academy.

- My 2nd post-doctoral fellowship was at Stanford U. with Mark Schnitzer, inventor of the nVista calcium-imaging mini-microscopes. Using data that I collected, along with methods that I developed to analyze the activity of large population of neurons, my work unraveled how learning new associations is encoded at the neuronal-ensemble level (Grewe et al. 2017) and shows how the correlation in the activity of the neurons limits the information that the network is capable of storing (Hazon et al., 2022). It should be noted that although this imaging technique is becoming more popular, it is seldom used for measuring data in the freely behaving animals. My team is one of the few in Europe that currently combines this technique with complex behaviors.

- Since 2015 in IDIBAPS (Barcelona, Spain), first as a Marie Curie Fellow and then as an independent researcher, I led a team studying how memories are encoded in the hippocampus and associative cortices. We immuno-ablated NMDA and other receptors, to generate animal models of amnesia, mimicking newly discovered synaptopathies (Zamani & Morales et al 2022). The team I led developed a novel automated task to measure spatial memory in mice (Morales et al., 2020). Cohorts of dozens of mice and trials ~100 trials per animal, provide enough data points per session to measure with statistical significant memory strength. The task provides experimental data to study semantic memory objects and how neuronal disorders affect this process.- I am now a Científico Titular at the CSIC, instituto Cajal (Madrid) where I will continue studying learning and memory, but now taking into account brain internal states and reinforcement learning as mechanism that can explain human fast learning in comparison with slow rates in learning machines.

- I have long experience lecturing courses, I worked as a lecturer at the U. of Buenos Aires, teaching physics, statistics, linear algebra and calculus to groups of more than 120 students in the departments of physics, economics, and the MBA at U. diTella. I also taught physics in several undergraduate courses at NYU.- I have experience mentoring students: 1 undergraduate, 2 Master students, and 3 Ph.D. students theses. I am also at the doctoral committee of the biomedicine Ph.D. program at the U. of Barcelona.

- I have obtained funding for my research in competitive international calls. I was awarded the prestigious Marie Curie IIF fellowship (206.500 €), and grants from Cellex Foundation: "Synaptic auto-immunity and visualization of circuits underlying memory and behavior" (557.000 €, co-IP), Caixa Foundation: "A translational model of antibody-mediated synaptic disease: Symptoms, neuronal circuits, and the mechanisms of memory loss and recovery" (498.718 €, co-IP), Plan Nacional from the Ministry of Science and innovation (108.900,0 €, IP) and "Imaging glutamatergic transmission and its brain structural and functional correlates during the neurodevelopmental pathway leading to schizophrenia: from rodents to humans" from Fundació Marató TV3 (297.978,5 €, co-IP), and I just got conferred the Plan Nacional 2022 from the Ministry of Science and innovation (225.000 € + a PhD student , IP).

Part C. RELEVANT ACCOMPLISHMENTS

C.1. Publications

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 Scientific paper.** AmirPasha Zamani; Paula Peixoto Moledo; David P. Cuesta; Horacio G. Rotstein; Josep Dalmau; Pablo E. Jercog. 2022. Anti-NMAR encephalitis antibodies cause long-lasting degradation of the hippocampal neural representation of memory. BioRxiv. Cold Spring Harbor Laboratory Journal.

- 2 **Scientific paper.** Omer Hazon; Victor Minces; David T. Cuesta; Surya Ganguli; Mark J. Schnitzer; Pablo E. Jercog. 2022. Noise correlations in neural ensemble activity limit the accuracy of hippocampal spatial representations. *Nature Communications*. Nature Publishing Group. 13-4276.
- 3 **Scientific paper.** Daniel Jercog; Nancy Winke; Kibong Sung; et al; Cyril Herry. 2021. Dynamical prefrontal population coding during defensive behaviours. *Nature*. Nature Publishing Group. 2170-49.
- 4 **Scientific paper.** Lucia Morales; David Tomàs; Josep Dalmau; Jaime de la Rocha; Pablo Jercog. 2020. High-throughput task to study memory recall during spatial navigation in rodents. *Frontiers in Behavioral Neuroscience*. FRONTIERS. 14-64.
- 5 **Scientific paper.** Pablo Jercog; Yashar Ahmadian; Caitlin Woodruff; Rajib Deb-Sen; Larry Abbott; Eric Kandel. 2019. Heading direction with respect to a reference point modulates place-cell activity. *Nature Communications*. Nature publishing group. 10-2333, pp.1-8.
- 6 **Scientific paper.** Grewe, BF; Grundemann, J; Kitch, LJ; et al; Schnitzer, MJ. 2017. Neural ensemble dynamics underlying a long-term associative memory. *NATURE*. 543-7647, pp.670-+. ISSN 0028-0836. WOS (23)
- 7 **Scientific paper.** Planaguma, J; Haselmann, H; Mannara, F; et al; Dalmau, J. 2016. Ephrin-B2 prevents N-methyl-D-aspartate receptor antibody effects on memory and neuroplasticity. *ANNALS OF NEUROLOGY*. 80-3, pp.388-400. ISSN 0364-5134. WOS (20)
- 8 **Scientific paper.** Jercog, PE; Svirskis, G; Kotak, VC; Sanes, DH; Rinzel, J. 2010. Asymmetric Excitatory Synaptic Dynamics Underlie Interaural Time Difference Processing in the Auditory System. *PLOS BIOLOGY*. 8-6. ISSN 1544-9173. WOS (53)
- 9 **Scientific paper.** Mathews, PJ; Jercog, PE; Rinzel, J; Scott, LL; Golding, NL. 2010. Control of submillisecond synaptic timing in binaural coincidence detectors by K(v)1 channels. *NATURE NEUROSCIENCE*. 13-5, pp.601-U115. ISSN 1097-6256. WOS (108)
- 10 **Scientific paper.** Jercog, PE; Trevisan, MA; Mindlin, GB. 2005. Subharmonics in the solutions of a model of the song motor nuclei in songbirds. *PHYSICA A-STATISTICAL MECHANICS AND ITS APPLICATIONS (Proceedings Medyfinol 2006)*. 356-1, pp.145-150. ISSN 0378-4371. WOS (0)
- 11 **Scientific paper.** Adrian Sanz-Magro; Noelia Granado; Mario García-Verdugo; et al; Rosario Moratalla. Dysfunction of dopaminergic neurons in the dorsal raphe nucleus and norepinephrine neurons in locus coeruleus causes anxiety and depression in a Parkinson's disease mouse model. In Submission process.
- 12 **Review.** Jercog, P; Rogerson, T; Schnitzer, MJ. 2016. Large-Scale Fluorescence Calcium-Imaging Methods for Studies of Long-Term Memory in Behaving Mammals. *COLD SPRING HARBOR PERSPECTIVES IN BIOLOGY*. 8-5. ISSN 1943-0264. WOS (8)

C.3. Research projects and contracts

- 1 **Project.** Imaging glutamatergic transmission and its brain structural and functional correlates during the neurodevelopmental pathway leading to schizophrenia: from rodents to humans. Gisela Sugranyes Ernest. (Instituto Cajal (CSIC)). 03/04/2023-31/03/2026. 297.978,5 €. Principal investigator.
- 2 **Project.** DECODING THE NEURONAL REPRESENTATION OF THE MEMORY OF "RULES" IN NORMAL AND AMNESIC CONDITIONS (DecRules). Pablo Jercog. (Institut d'Investigacions Biomèdiques August Pi i Sunyer). 01/06/2020-01/06/2023. 108.900 €.
- 3 **Project.** A Translational Model of Antibody-mediated Synaptic Disease: Symptoms, Neuronal Circuits, and the Mechanisms of Memory Loss and Recovery. La"Caixa" foundation. (Institut d'Investigacions Biomèdiques August Pi i Sunyer). 01/01/2019-31/12/2021. 498.718 €. Team member.
- 4 **Project.** Immune-mediated diseases of the synapse: symptoms, brain networks, and the link to human memory. Proyectos Integrados de Excelencia, Instituto de Salud Carlos III. (Institut d'Investigacions Biomèdiques August Pi i Sunyer). 01/01/2017-31/12/2019. 557.000 €. Team member.
- 5 **Project.** Maria Curie International Incoming Fellow. Pablo Jercog. (Institut d'Investigacions Biomèdiques August Pi i Sunyer). 09/04/2015-08/04/2017. 206.500 €.
- 6 **Project.** Reinforcement learning as a path to understanding declarative memories. Pablo Jercog. (Instituto Cajal (CSIC)). From 01/01/2024. 180.000 €.