

Curriculum Vitae

Dr. Pablo Jercog

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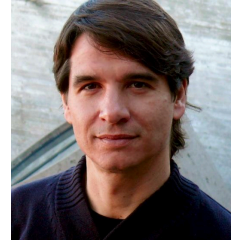
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Personal Data:

Date of Birth: August 24, 1976

Birthplace: C.A.B.A., Buenos Aires, Argentina

Citizenship: Argentine, Italian.



Research Experience: (Team lab-page: <https://sites.google.com/view/pablojercogteam/>)

09/04/2017 – present	IDIBAPS <i>Assistant researcher (R2C): team-leader</i>	Barcelona, Spain
09/04/2015 – 08/04/2017	IDIBAPS <i>Marie Curie Fellow (w./ Josep Dalmau)</i>	Barcelona, Spain
03/06/2013 – 03/04/2015	Stanford U. Dept. of Biology & Medical School <i>Associate Research Scientist (w./ Mark Schnitzer)</i>	Palo Alto, CA, USA
18/07/2008 – 30/05/2013	CUMC Department of Neuroscience <i>Postdoctoral Fellow (w./ Eric Kandel & Larry Abbott)</i>	New York, NY, USA

Education:

09/09/2002 – 02/05/2008	New York Univ., Physics Dept. / Neuroscience Dept. <i>Ph.D. Thesis supervisors: John Rinzel & Dan Sanes</i> <i>Ph.D. degree 15/05/2008 (Major: Neuroscience/Biophysics)</i> <i>Ms.Sci. degree 15/01/2005 (Major: Physics/Applied Math)</i>	New York, NY, USA
07/08/2006 – 01/09/2006	Advance Course in Comput. Neuroscience	Arcachon, France
17/03/1997 - 06/09/2002	Univ. de Buenos Aires, Physics Dept. <i>Licenciado en Ciencias Físicas (M.Sci. - equivalent)</i>	Buenos Aires, Argentina

Biosketch:

My most valuable expertise is the scientific management projects from theoretical to experimental components. I currently lead a team with several Ph.D. students under my supervision and am supported by the funding obtained under competitive calls from public and private funding institutions. I have specialized my team's techniques in the use of **functional calcium imaging**, optogenetics, fiber-photometry and electrophysiology.

I have supervised and trained researchers in several neuronal-activity recording and analysis techniques. I gained expertise in these techniques over the years of conducting research in several of the top neuroscience labs in the world. The following categories can list these techniques:

1. Long-term recordings of population neurons using electrodes and shanks in the laboratory of Eric Kandel (Columbia U.), in collaboration with Edvard and May-Britt Moser (NTNU). Results published in "Heading direction with respect to a reference point modulates place-cell activity" are listed below the *Publications* section.
2. Long-term recordings of calcium activity using 1-photon mini-microscopes, 2-photon microscopes, optogenetics, and fiber-photometry in the lab of Mark Schnitzer (Stanford U.), inventor of some of these techniques. Results obtained with these techniques can be found in: "Noise correlations in neural ensemble activity limit the accuracy of hippocampal spatial representations," listed below.
3. Develop new behavioral tasks for learning & memory, and test several cognitive and social behavior impairments. Results published in: "High-throughput task to study memory recall during spatial navigation in rodents," "Long-lasting degradation of spatial and memory code explains the slow recovery of NMDAR immunoablation," and "Behavioral impairments in short and long-term spatial memory demand in an animal model of inducible anti-NMDA encephalitis," listed below.
4. Development of methods and computational tools to process and analyze the data obtained from

the mentioned methodologies. In particular, machine learning methods to get response functions of neurons involved in different behaviors, such as decision making, memory, navigation, social interaction, and inherited responses. For examples, see: “Neural ensemble dynamics underlying a long-term associative memory,” “Heading direction with respect to a reference point modulates place-cell activity,” “High-throughput task to study memory recall during spatial navigation in rodents,” “Dynamical prefrontal population coding during defensive behaviors,” “Noise correlations in neural ensemble activity limit the accuracy of hippocampal spatial representations.”

Publications: https://scholar.google.com/citations?user=_vulcygAAAAJ&hl=en

- **P.E. Jercog** & P. Latham. Catastrophic forgetting and what to do about it (in preparation).
- P. Peixoto, AP. Zamani, J. Dalmau, Y. Ahmadian, and **P.E. Jercog**. Behavioral impairments in short and long-term spatial memory in an amnesic animal model of inducible anti-NMDA encephalitis (in preparation).
- AP. Zamani, P. Peixoto, D.P. Tomàs, H.G. Rotstein, J. Dalmau and **P.E. Jercog**. Long-lasting degradation of spatial and memory code explains the slow recovery of NMDAR immunoablation (submitted for peer-reviewed publication).
- Hazon, O., Minces, V.H., Tomàs, D.P., Ganguli, S., Schnitzer, M.J., **Jercog, P.E.**, Noise correlations in neural ensemble activity limit the accuracy of hippocampal spatial representations. *Nat Commun* 13, 4276 (2022) **(IF: 17.69)**
- Jercog, D., Winke, N., Sung, K., Fernandez, M.M., Francioni, C., Rajot, D., Courtin, J., Chaudun, F., **Jercog, P.E.***, Valerio, S.* and Herry, C.*, 2021. Dynamical prefrontal population coding during defensive behaviors. *Nature*, pp.1-5. (**I co-supervised with Valerio and Herry*). **(IF: 42.78)**
- L. Morales, D.P. Tomàs, J. Dalmau, J. de la Rocha J, **P.E. Jercog**. High-throughput task to study memory recall during spatial navigation in rodents. *Front. Behav. Neurosci.*, 15 May 2020. **(IF: 2.51)**
- **P.E. Jercog***, Y. Ahmadian, C. Woodruff, R. Deb-Sen, L.F. Abbott, E.R. Kandel (2019) Heading direction with respect to a reference point modulates place-cell activity. *Nature Communications* 10 (2333), 1-8. (*=corresponding author) **(IF: 12.12)**
- B.F. Grewe, J. Gründemann, L.J. Kitch, J.A. Lecoq, J. G. Parker, J.D. Marshall, M.C. Larkin, **P.E. Jercog**, F. Grenier, J.Z. Li, A. Lüthi & M.J. Schnitzer (2017). Neural ensemble dynamics underlying a long-term associative memory. *Nature*, 543(7647), p.670. (*I developed the data analysis measure to quantify memory formation, as is reflected in the contributions section*). **(IF: 42.78)**
- Planagumà J., Haselmann H., Mannara F., Petit-Pedrol M., Grünewald B., Aguilar E., Röpke L., Martín-García E., Titulaer M.J., **Jercog P.E.**, Graus F., Maldonado R., Geis C., Dalmau J. (2016) Ephrin-B2 prevents N-methyl-D-aspartate receptor antibody effects on memory and neuroplasticity. *Annals of Neurology*. 80 (3) 388-400. (*I contributed as electrophys. supervisor*) **(IF: 9.037)**
- **P.E. Jercog**, G. Svirskis, V.C. Kotak, D.H. Sanes, J. Rinzel (2010) Bilateral asymmetry of excitatory synaptic properties shapes ITD processing in gerbil MSO. *PLoS Biol.* 8(6): e1000406. **(IF: 7.076)**
- P.J. Mathews* & **P.E. Jercog***, J. Rinzel, L. Scott, N.L. Golding (2010) Kv1 potassium channels (IKLVA) sharpen submillisecond dendritic excitation in binaural auditory coincidence detectors. (*=equal contribution) *Nature Neuroscience* 13(5): 601-9 **(IF: 17.810)**
- **P.E. Jercog**, M.A. Trevisan, G.B. Mindlin (2005) Subharmonics in the solutions of a model of the song motor nuclei in songbirds. *Physica A*, 356: 145-150 **(IF: 3.60)**

Book Chapters:

Jercog PE, Rogerson T, and Schnitzer MJ. (2016) Large-Scale Fluorescence Calcium-Imaging Methods for Studies of Long-Term Memory in Behaving Mammals Learning and Memory. Book Series: A Cold Spring Harbor Perspectives in Biology Collection

Current Support:

- 06/2020 – 05/2023 **Proyectos de I+D+i Retos Investigación (Tipo B)** Barcelona, Spain
 Title: Decoding the neuronal representation of the memory of rules in normal and amnesic conditions. Ref#: PID2019-110427RB-I00. Amount: 108.900 € (**PI: P. Jercog**)
- 01/2019 – 12/2022 **La “Caixa Bank” foundation**
 Title: A translational model of antibody-mediated synaptic disease: symptoms, neuronal circuits, and the machinery of memory loss and recovery.
 Ref#: HR17-00149, Amount: 498.718 € (**as team member / PI: J. Dalmau**)

Past Support:

- 01/2017 – 12/2019 **Proyectos Integrados de Excelencia (PIE), Instituto de Salud Carlos III.**
 Title: Immune-mediated diseases of the synapse: symptoms, brain networks, and the link to human memory, Amount: 557.000 €. (**as team member / PI: J. Dalmau**)
- 04/2015 – 04/2017 **Maria Curie International Incoming Fellow.**
 Title: The neural circuit mechanisms of anti-NMDA receptor encephalitis: revealing the role of NMDA receptors in spatial memory in mice. Ref#: IIF-627457 (ISOLM). Amount: 206.500€. (**IR: P. Jercog**)

Member of the reviewers board:

- 12/2020 - present Journal of Neuroscience Methods
 10/2021 - present Frontiers in Computational Neuroscience

Mentorship Experience and Responsibilities:

- 06/2020 – present **IDIBAPS, Universidad de Barcelona** Barcelona, Spain
Ph.D. Advisor. Ph.D. candidate: Paula Peixoto
- 10/2019 – present **IDIBAPS, Universidad de Barcelona** Barcelona, Spain
Ph.D. Advisor. Ph.D. candidate: AmirPasha Zamani
- 11/2016 – 12/2018 **IDIBAPS, Universidad de Barcelona** Barcelona, Spain
Master Thesis Advisor. Candidate: David Tomàs Cuesta
- 10/2015 – 10/2018 **IDIBAPS, Universidad de Barcelona** Barcelona, Spain
Ph.D. Advisor. Ph.D. candidate: Lucía Morales
- 10/2016 – 12/2017 **IDIBAPS, Universidad de Barcelona** Barcelona, Spain
Master Thesis Advisor (Erasmus) candidate: Silvia Pagliarini
- 06/2016 – 03/2017 **IDIBAPS, Universidad de Barcelona** Barcelona, Spain
Ph.D. co-Advisor. Ph.D. candidate: Maximilian Fischer
- 11/2011 – 05/2012 **Columbia University, Biology Dept.** New York, NY, USA
Mentor for the student at BIOL W3500 Course (Independent Research for College and GS Students) Student's name: Rajeev Deb-Sen

Teaching Experience

- 01/08/2010 - 27/08/2010 **Advance course in computational neuroscience 2010** Freiburg, Germany
Teaching Assistant
- 02/08/2009 - 28/08/2009 **Advance course in computational neuroscience 2009** Freiburg, Germany
Teaching Assistant
- 13/01/2003 – 19/05/2006 **Depart. of Physics, New York University** New York, NY, USA
Teaching Assistant
- 14/01/2002 – 29/03/2002 **DiTella University (Master in Finance program)** Buenos Aires, Arg.
Teaching Assistant
- 13/03/2000 – 21/12/2001 **Depart. of Physics, Universidad de Buenos Aires** Buenos Aires, Arg.
Teaching Assistant
- 16/03/1998 – 10/03/2000 **Univ. de Buenos Aires, Dept. of Prelim. Courses** Buenos Aires, Arg.
Lecturer

Conference presentations:

1. P.E. Jercog, G.B. Mindlin (2004) Subharmonics in the solutions of a model of the song motor nuclei in songbirds. Medyfinol Conference 2004 (poster).
2. P.E. Jercog, D. Sanes, J. Rinzel (2006) Bilateral asymmetry of excitatory synaptic properties shape ITD processing in gerbil MSO. EAR Meeting 2006 (oral presentation).
3. P.E. Jercog, G. Svirskis, V.C. Kotak, D.H. Sanes, J. Rinzel (2006) Bilateral asymmetry of excitatory synaptic properties shapes ITD processing in gerbil MSO. Society for Neuroscience 2006 (poster).
4. P.J. Mathews, P.E. Jercog, J. Rinzel, L. Scott, N.L. Golding (2006) Potassium channels sharpen submillisecond excitation in the dendrites of auditory coincidence detector neurons Society for Neuroscience 2006 (poster).
5. P.E. Jercog, G. Svirskis, V.C. Kotak, D.H. Sanes, J. Rinzel (2007) Functional asymmetry of excitatory currents in the MSO. Society for Neuroscience 2007 (poster).
6. P.E. Jercog, V.C. Kotak, D.H. Sanes, J. Rinzel, (2008) Asymmetry in electrotonic length positions the ITD response function in gerbils MSO neurons. Society for Neuroscience 2008 (poster).
8. P.E. Jercog, L. Abbott, E. Kandel (2009) Assessing how attention modulates spatial memory representation. "Gatsby C.N.U. in London" annual Meeting 2009 (oral presentation).
9. P.E. Jercog, L. Abbott, E. Kandel (2011) Testing the Randomness of Hippocampal Place-Cell Remapping. Society for Neuroscience 2011 (poster).
10. P.E. Jercog, Y. Ahmadian, L. Abbott, E. Kandel (2012) Increase in efficiency and accuracy of the hippocampal spatial representation over time. Swartz meeting 2012 – San Diego (poster).
11. P.E. Jercog, Y. Ahmadian, L. Abbott, E. Kandel (2012) Increase in efficiency and accuracy of the hippocampal spatial representation over time. Swartz meeting 2012 – San Diego (oral presentation).
12. L. Morales, J de la Rocha, J Dalmau, PE Jercog (2016) The neural mechanisms of hippocampal long-term spatial memory: novel use of anti-NMDA receptor antibodies. BARCCSYN meeting 2016. Barcelona, Spain (poster).
13. T. Rogerson, J. Maxey, P.E. Jercog, T. Kim, S. Eismann, B. Ahanonu, B. Grewe, M. Schnitzer (2016) CA1 hippocampal ensemble neural activity reveals associative representations in the hippocampus of mice acquiring a bi-conditional learning task. Society for Neuroscience meeting (2016). San Diego, USA (poster).
14. L. Morales, J. de la Rocha, J. Dalmau, P.E. Jercog (2017) The neural mechanisms of hippocampal long-term spatial memory: novel use of anti-NMDA receptor antibodies. Memory Symposia (2017) CRM (UAB) Barcelona, Spain (poster).
15. L. Morales, J. de la Rocha, J. Dalmau, P.E. Jercog (2017) The neural mechanisms of hippocampal long-term spatial memory: novel use of anti-NMDA receptor antibodies. BARCCSYN meeting 2017, Barcelona, Spain (poster).
16. D. Tomàs-Cuesta, J. de la Rocha, P.E. Jercog*, M. Schnitzer* (2017) The dynamics of place encoding in hippocampal neuronal ensembles. BARCCSYN meeting 2017, Barcelona, Spain. (*=co-last authors) (poster).
17. L. Morales, J. de la Rocha, J. Dalmau, P.E. Jercog (2017) The neural mechanisms of hippocampal long-term spatial memory: novel use of anti-NMDA-receptor antibodies. Sociedad Española de Neurociencias (SENC) meeting 2017, Alicante, Spain (poster).
18. T. Rogerson, J. Maxey, P.E. Jercog, T. Kim, S. Eismann, B. Ahanonu, B. Grewe, M. Schnitzer (2017) Long-term imaging of ensemble neural calcium dynamics in the perirhinal cortex of freely behaving mice learning context-stimulus associations. SFN meeting 2017. Washington DC, USA (poster).
19. L. Morales, J. de la Rocha, J. Dalmau, P.E. Jercog (2018) The neural mechanisms of hippocampal long-term spatial memory: design of a novel spatial navigation task. BARCCSYN meeting 2018, Barcelona, Spain (poster).
20. D. Tomàs-Cuesta, J. de la Rocha, Josep Dalmau, P.E. Jercog (2018) How spaced learning affects stability of hippocampal neural correlates of learning. BARCCSYN meeting 2018, Barcelona, Spain. (*=co-last authors) (poster).
21. L. Morales, J. de la Rocha, J. Dalmau, P.E. Jercog (2018) The neural mechanisms of hippocampal long-term spatial memory: design of a novel spatial navigation task. FENS conference 2018,

- Berlin, Germany (poster).
22. P.E. Jercog (2019) Heading direction with respect to a reference point modulates place-cell activity, BARCCSYN 2019, Barcelona, Spain (oral presentation).
 23. P.E. Jercog (2019) Novel method to study memory formation and recall at the neuronal population level. Invited talk at the symposium: "Cell type diversity in the hippocampus and its role in health and disease", SENC biannual meeting 2019, Santiago de Compostela, Spain (oral presentation).
 24. O. Hazon, D.P. Tomàs, V.H. Minces, S. Ganguli, M.J. Schnitzer & P.E. Jercog (2019) Correlated fluctuations in hippocampal neural ensemble activity patterns limit the accuracy of spatial representations, SFN annual meeting 2019, Chicago, USA (poster).
 25. AP. Zamani, P. Peixoto, D.P. Tomàs, J. Dalmau, P.E. Jercog (2021) Long Lasting Degradation of Hippocampal Spatial Representation in the Mouse Model of Anti-NMDAR Encephalitis. [Tubingen Summer School](#) and conference in "Current and future applications of network and control sciences for Psychiatry", Tubingen, Germany (poster).
 26. P. Peixoto-Moledo, J. Dalmau, P.E. Jercog (2021) Interference-based forgetting in a goal-directed spatial navigation task for rodents. SENC meeting, Lleida, Spain (poster and teaser presentation).
 27. AP. Zamani, P. Peixoto, D.P. Tomàs, J. Dalmau, P.E. Jercog (2022) Long Lasting Degradation of Hippocampal Spatial Representation in the Mouse Model of Anti-NMDAR Encephalitis. FENS meeting, Paris, France (poster).
 28. P. Peixoto-Moledo, A.P. Zamani, S. Barman, N. Goebels, J. Dalmau, P.E. Jercog (2022) Interference-based forgetting in a goal-directed spatial navigation task for rodents. FENS meeting, Paris, France (poster)