

David Benacom, Ph.D.

He/his

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## Education

2020 – 2023, **Ph.D. Neurosciences, Collège de France** (PSL University), Paris

Directed by A. Di Nardo & A. Prochiantz - “Félicitations du jury”.

2017 – 2021, **Normalien** (MS2017), **École Normale Supérieure** (ENS-Ulm), Paris.

Neurosciences, bioinformatics (IMaLiS) and inter-disciplinary degree (DENS).

2015 – 2027, **M.D., Sorbonne Université**, Paris.

Top 0.01% admission test.

## Professional positions

2024 –, **Postdoctoral research, Stanford University**, Stanford.

Working in E. Mignot laboratory. Circadian Rhythms, machine Learning and genetics.

2015 – 2018, 2024 –, **Clerkship, Hôpital de la Pitié Salpêtrière**, Paris.

4-month rotations in medicine and surgery.

2019 – 2024, **M2, Assistant engineer, Graduate and Postdoctoral research, Collège de France**, Paris.

Working in A. Prochiantz laboratory. Neurosciences, epigenetics and bioinformatics.

2018, **M1, Institut Pasteur**, Paris.

Working in G. Cecere laboratory. Epigenetic inheritance.

## Competences

- Main expertise in quantitative analysis of multi-omics, microscopy, and behavioral data in R, Python, C and Java. Extensive experience on machine-learning modeling on human plasmatic proteins.
- Animal surgery, engineering and conduction of behavioral tests.
- Histology, viral vector design including CRISPR-Cas9, advanced molecular techniques (Purifications, TRAP, CUTnRUN...), cell culture.
- Collaborative work, writing proficiency, student management, associative involvement.

## Professional summary

My research centers on enhancing adult neural plasticity to enable therapeutic circuit rewiring. I focused on post-natal critical period biology and molecular strategies to promote plasticity in the adult brain. We showed that PV cells, key regulators of critical periods, miss a common transcriptomic pathway across different enhanced-plasticity paradigms, suggesting that multiple genetic routes can converge on similar functional plasticity. Building on this, we developed two disease models, Parkinson's disease and early-life stress, and tested plasticity modulation as a therapeutic strategy, with encouraging results. In the lab, I established methods and analysis pipelines for CUTnRUN, ATAC, and TRAP-Seq, as well as automated video tracking and machine-learning-based microscopy analysis that remain in use. I extended this work through a short bioinformatics post-doc on astrocyte transcriptomic data in collaboration with N. Rouach.

I then joined the E. Mignot laboratory at Stanford to apply machine learning to medical data, investigating circadian rhythms using blood proteins. My contribution focuses on inferring organ-related circadian signals from blood markers alone. I am continuing this project while completing my medical degree, with a long-term goal of working at the interface of medicine, neuroscience, and AI, integrating principles of brain metaplasticity and connectomics into AI algorithms.

## Publications

- Chataing, C.\*, **Benacom, D.\***, Prochiantz, A., Di Nardo A. A. (2024). Choroid plexus alterations following early-life stress are reversed with Otx2 loss of function. *In preparation*.
- **Benacom, D.\***, Chataing, C. \*, Prochiantz, A., Di Nardo A. A. (2025). Motor recovery through perineuronal net modulation in a Parkinson's disease mouse model.  
*Brain*, awaf226, <https://doi.org/10.1093/brain/awaf226>
- **Benacom, D.**, Chataing, C., Apulei, J., Queguiner, I., Prochiantz, A., Di Nardo A. A. (2023). Plasticity state-dependent changes in visual cortex parvalbumin interneuron mRNA translation and chromatin.  
*BioRxiv*, <https://doi.org/10.1101/2023.09.11.557035>
- Gibel-Russo, R.\*, **Benacom, D.\***, & Di Nardo, A. A. (2022). Non-Cell-Autonomous Factors Implicated in Parvalbumin Interneuron Maturation and Critical Periods.  
*Frontiers in Neural Circuits*, 16. <https://doi.org/10.3389/FNCIR.2022.875873>
- Planques, A.\*, Moreira, V. O.\*, **Benacom, D.**, Bernard, C., Jourden, L., Blugeon, C., Dingli, F., Masson, V., Loew, D., Prochiantz, A., & Di Nardo, A. A. (2021). OTX2 Homeoprotein Functions in Adult Choroid Plexus.  
*International Journal of Molecular Sciences*, 22(16). <https://doi.org/10.3390/IJMS22168951>

\* : Co-first authorship

## Conferences

Circadian Clock Dynamics and Physiology Across Biological Scales (2025, Barcelona)  
TERAIS (2024, Bratislava)  
Cognitive modeling (2024, Groningen)  
ENCODS (2022, Paris- 2023, Faro),  
Israel Society of Neurosciences (2019, 2020, Eilat),  
Curie Institute, Epigenetics Course (2019, Paris).

## Invited speaker

A.Loupy PITOR labmeeting (2025, Paris)  
Harvard Circadian laboratory Seminar (2025, Boston)  
CIRB seminar (2023, Paris)

## Teaching and supervision

2020 – 2023, **Université de Paris-Cité**, Paris.

Teaching assistant in Biochemistry. Subjects covered: Molecular biology, Proteomics, Thermodynamics, Cellular Biology...

2016 – 2019, **Sorbonne**, Paris.

Tutor for pre-med student. Subjects covered: Biology, Chemistry, Anatomy, Physics and Biophysics.

2019 – 2024, **Collège de France**, Paris.

Supervision of Camille Chataing (M2 Sorbonne), Sofia El-hanafi (M2 Sorbonne), Pierre-Alexandre Curty (M1 EPHE), Uma Mani (Pre-med UChicago), Marion Binet (L2 psychology).

## Associative

Organization of the 2022 edition of ENCODS meeting (FENS satellite event)

Member of ANDC (for MD-PhD), Gali'ENS, Israel Society for Neurosciences, Pasteur Institute former students, A-Ulm

Organization of the MIT Grand Hack Paris 2020

## Personal interests

Writing (Novels, poems).

Climbing, swimming, cycling.

Programming, robotics.

## References

Emmanuel Mignot : [mignot@stanford.edu](mailto:mignot@stanford.edu)

Alain Prochiantz: [alain.prochiantz@college-de-france.fr](mailto:alain.prochiantz@college-de-france.fr)

Ariel Di Nardo: [ariel.dinardo@college-de-france.fr](mailto:ariel.dinardo@college-de-france.fr)

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