João Morais

Msc in Neurobiology

joaopfmorais@gmail.com
Valpaços, Portugal
estrondio@github.io

SUMMARY

- **I am a** neurobiology MSc with a background in systems and behavioral neuroscience.
- **I have experience in** animal behavior, stereotaxic surgeries, optogenetics, electrophysiology, construction and automation of behavioral setups, immunohistochemistry, and some coding.
- **I am interested in** the deconstruction of cognitive processes through the exploration of their behavioral and neural correlates.
- **I am looking for** a research project in live animal models that uses recordings and interventive methods to study neural circuits' architecture, dynamics, and mechanistic function.

RESEARCH EXPERIENCE

RESEARCH TECHNICIAN, Barcelona, Spain

Institut Català de Nanociència i Nanotecnologia (ICN2), March 2022-October 2022

- Designed a multiplex staining protocol to assess the expression of different 5-HT receptors among excitatory and inhibitory neurons.
- Preprocessed and processed raw neural electrophysiology data using adapted Python scripts to tailor files for spike sorting and local field potential.
- Studied the modulation of prefrontal-hippocampal neural dynamics by 5-HTR7 using SPSS to analyze power spectrum, phase-amplitude coupling, phase coherence, and signal directionality.

RESEARCH TECHNICIAN / MSC STUDENT, Lisbon, Portugal

Champalimaud Centre for the Unknown, September 2018 - September 2021

- Maintained and implemented a head-fixed foraging task automated setup, using Arduino boards, python, and Matlab, to study decision-making in behaving mice.
- Prepared mice for acute electrophysiology and optogenetics experiments by performing custom stereotaxic surgeries that included viral microinjection and the implantation of optic fibers, headbar, and ephys apparatus.
- Contributed to the implementation and fine-tuning of the optogenetics stimulation protocol.
- Independently managed a diverse experimental cohort, from reception to transcardiac perfusion.
- Imaged brain slices (Axioscan), quantified infected cells using QPath, and mapped brain slices using QuickNII.
- Co-authored two scientific papers in high-impact peer-reviewed journals.

BSC INTERNSHIP STUDENT, Porto, Portugal
Institute for Research and Innovation in Health (i3S); Faculty of Medicine of Porto University (FMUP)
March 2017 - December 2017

- Conducted surgeries for local drug delivery (bupivacaine) and implemented a urethral lesion model in female rats, contributing to a study on the regeneration of the lesioned external urethral sphincter.
- Independently managed dozens of samples from the collection, processing in paraffin, and slicing to various histological staining techniques, including immunohistochemistry, to facilitate an in-depth analysis of urethral tissues.
- Executed image acquisition using fluorescence microscopy to capture detailed visuals of the treated urethras. Analyzed and quantified results on ImageJ.
- Published our results as an abstract in a peer-reviewed local journal as a poster session.

EDUCATION

MASTER IN NEUROBIOLOGY - Faculdade de Medicina da Universidade do Porto
Dissertation: “Behavioral effects of DRN stimulation on a Head-fixed Foraging Task” (Porto, Nov. 2019)

BACHELOR IN GENETICS AND BIOTECHNOLOGY - Universidade de Trás-os-Montes e Alto Douro
Dissertation: “Bupivacaine on external Urethral sphincter regeneration” (Vila Real, Sep. 2017)

PUBLICATIONS

A RESERVOIR OF FORAGING DECISION VARIABLES IN THE MOUSE BRAIN
Fanny Cazettes, Luca Mazzucato, Masayoshi Murakami, Joao P Morais, Elisabete Augusto, Alfonso Renart, Zachary F Mainen
Nat Neurosci . 2023 May;26(5):840-849. doi: 10.1038/s41593-023-01305-8. Epub 2023 Apr 13

PHASIC ACTIVATION OF DORSAL RAPHE SEROTONERGIC NEURONS INCREASES PUPIL SIZE
Fanny Cazettes , Davide Reato, João P Morais, Alfonso Renart, Zachary F Mainen
Curr Biol . 2021 Jan 11;31(1):192-197.e4. doi: 10.1016/j.cub.2020.09.090. Epub 2020 Nov 12.

BUPIVACAINE TREATMENT ENHANCES THE REGENERATION OF THE LESIONED EXTERNAL URETHRAL SPHINCTER OF THE RAT: PS173
Morais, J. P; Torrado, M; Avelino, A.
Porto Biomed J . 2017 Sep-Oct;2(5):203-204. doi: 10.1016/j.pbj.2017.07.068. Epub 2017 Sep 1.
