

ORIO PAVÓN AROCAS

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Education

- 2016 – present **Wellcome Trust 4-Year PhD in Neuroscience**
Sainsbury Wellcome Centre for Neural Circuits and Behaviour
University College London, UK
Supervisor: Prof Dr Tiago Branco
- 2013 – 2015 **Master of Science (M.Sc.), Neurosciences**
Elite Network of Bavaria, Graduate School of Systemic Neurosciences
Ludwig-Maximilians-Universität München, Germany
GPA: 1.31 (German system)
- 2009 – 2013 **Bachelor of Science (B.Sc.), Biomedical Sciences**
Universitat Autònoma de Barcelona, Bellaterra (Barcelona), Spain
GPA: 8.39/10

Research experience

09. 2017 – present **PhD Thesis | Biophysical properties and gene expression profile of single Periaqueductal Gray neurons**
Sainsbury Wellcome Centre for Neural Circuits and Behaviour, University College London, UK
I am combining electrophysiology and single-cell RNA sequencing to investigate the contribution of midbrain inhibitory neurons to the computation and selection of defensive behaviours to innately threatening stimuli and identify molecular signatures of biophysical properties critical for computing such behaviours.
Thesis director: Prof Dr Tiago Branco
05. 2017 – 07. 2017 **PhD Rotation 3 | Whole-brain activity maps of drug-induced sleep rebound in larval zebrafish**
Department of Cell and Developmental Biology, University College London, UK
Followed a combinatorial approach including behavioural assays, immunohistochemistry, two-photon imaging, and registration of whole-brain activity maps to investigate sleep regulation in zebrafish.
Supervisor: Prof Dr Jason Rihel
02. 2017 – 04. 2017 **PhD Rotation 2 | Inhibition in the Periaqueductal Gray**
Sainsbury Wellcome Centre for Neural Circuits and Behaviour, University College London, UK
Employed targeted somatic cell-attached and whole-cell recordings, ChR2-assisted circuit mapping, electrical stimulation, and pharmacology to study the properties and connectivity of VGAT+ neurons in a midbrain circuit involved in the computation of innate defensive behaviours.
Supervisor: Prof Dr Tiago Branco
11. 2016 – 01. 2017 **PhD Rotation 1 | Noradrenergic modulation of astrocytic glutamate uptake currents**
Department of Neuroscience, Physiology and Pharmacology, University College London, UK
Combined whole-cell patch-clamp recordings with pharmacology in acute brain slices of rat hippocampus to study the glutamate uptake currents of astrocytes and their regulation by neuromodulators.
Supervisor: Prof Dr David Attwell

03. 2015 – 09. 2015 **M.Sc. Thesis | Sleep regulation in *Drosophila***
Centre for Neural Circuits and Behaviour, DPAG, University of Oxford, UK
 For my M.Sc. Thesis I established a photoactivatable GFP-based tracing method combined with two-photon laser scanning microscopy to map the neuronal circuitry involved in the homeostatic regulation of sleep in *Drosophila*.
Thesis directors: Prof Dr Gero Miesenböck and Prof Dr Alexander Borst
01. 2015 – 03. 2015 **M.Sc. Rotation 3 | Neuronal mechanisms of vocal patterning in the catfish *Ariopsis seemani***
Division of Neurobiology, Faculty of Biology, LMU München, Germany
 Establishment of a whole-brain preparation for *in vitro* electrophysiology to study the neuronal mechanisms of vocal patterning in the catfish *Ariopsis seemani*.
Supervisor: Prof Dr Boris Chagnaud
10. 2014 – 12. 2014 **M.Sc. Rotation 2 | Calcium dynamics in the axon initial segment**
Dept. Axonal Signalling, Netherlands Institute for Neuroscience, Amsterdam, Netherlands
 Combined whole-cell patch-clamp recordings with OGB-1-based calcium imaging and pharmacology to study the calcium dynamics underlying action potential generation in the axon initial segment of layer V pyramidal neurons of somatosensory cortex in acute brain slices of mice and rats.
Supervisors: Prof Dr Maarten H.P. Kole and Dr Marko Popovic
02. 2014 – 04. 2014 **M.Sc. Rotation 1 | Optogenetic manipulation of the lateral septum in mice selectively bred for high anxiety-related behaviour**
Neuronal Plasticity Group, Max Planck Institute of Psychiatry, München, Germany
 Performed bilateral injections of AAV constructs carrying Archaeorhodopsin to ventral hippocampal cells projecting to the lateral septum to assess the effects of optogenetic inhibition of these projections on anxiety-related behaviour in the open field and elevated plus maze tests.
Supervisor: PD Dr Carsten Wotjak
10. 2012 – 06. 2013 **B.Sc. Thesis | Potentiation and recovery of memory by ICSS in rats**
Institute of Neurosciences, Universitat Autònoma de Barcelona, Spain
 Stereotaxic surgeries to implant electrodes in the medial forebrain bundle in the lateral hypothalamus and to perform electrolytic lesions in the lateral amygdala. Performed behavioural training of rats in a two-way shuttle box active avoidance-conditioning task followed by intracranial self-stimulation (ICSS) in a Skinner box.
Supervisor: Dr Pilar Segura Torres

Additional experience

04. 2014 – 10. 2014 Research assistant at the group of **Prof Dr Benedikt Berninger** investigating the role of Sox2 in direct lineage reprogramming of astroglia and pericytes to neurons.
Institute of Physiology, Dept. Physiological Genomics, LMU München, Germany
08. 2012 Research exchange student (IFMSA) with **Prof Dr M. Zafer Gören** studying the effects of the GABAergic system in DMH of rats with haemorrhagic shock.
Dept. of Medical Pharmacology, Faculty of Medicine, Marmara University, Istanbul, Turkey
10. 2011 – 12. 2011 Research internship with **Dr Elisa Martró** investigating the genetic variability of the hepatitis C genotype 1 virus in relation to the antiviral treatment response.
Dept. of Microbiology, Hospital Universitari Germans Trias i Pujol, Badalona, Spain
08. 2011 – 09. 2011 Summer internship at the group of **Dr Ruben López-Vales** learning molecular biology and histology techniques to study a murine model of spinal cord injury.
Institute of Neurosciences, Universitat Autònoma de Barcelona, Spain
07. 2011 Summer internship with **Dr Rosa Mirapeix** performing micro- and macro-dissections of the human Central Nervous System.
Faculty of Medicine, Universitat Autònoma de Barcelona, Spain

Publications

- bioRxiv | 2020 A cortico-collicular circuit for accurate orientation to shelter during escape
Vale R, Campagner D*, Iordanidou P, **Pavón Arocas O**, Tan YL, Stempel AV, Kesbarazci S, Petersen R, Margrie T, Branco T*
- eLife | 2020 Ca²⁺ entry through Nav channels generates submillisecond axonal Ca²⁺ signalling
Hanemaaijer NAK, Popovic MA*, Wilders X, Grasman S, **Pavón Arocas O**, Kole MHP*
- Neuron | 2019 The neuropeptide Galanin is required for homeostatic rebound sleep following increased neuronal activity
*Reichert S, **Pavón Arocas O**, Ribel J*

Fellowships & Awards

06. 2019 External Training Course Fund towards CSHL course | £1,000
School of Life and Medical Sciences, University College London
06. 2018 External Training Course Fund towards NSAS course | £802
School of Life and Medical Sciences, University College London
- 2016 – 2020 Wellcome Trust 4-Year PhD in Neuroscience | £133,252.00
University College London
- Wellcome Trust 4-Year Doctoral Programme in Neuroscience (M.Sc. + DPhil)
University of Oxford (Declined)
- DPhil in Ion Channels and Membrane Transport in Health and Disease (OXION)
funded by the University of Oxford (Declined)
- MRes/PhD in Developmental Neurobiology
King's College London (Declined)
03. 2015 – 09. 2015 Erasmus+ Traineeship Scholarship, M.Sc. Thesis Project in Oxford | £2,425.4
European Commission
08. 10. 2014 Poster Award – Rookie of the Year 2014 (best poster for a M.Sc. student)
GSN Symposium, Graduate School of Systemic Neurosciences, LMU Munich
10. 2014 – 12. 2014 Erasmus+ Traineeship Scholarship, M.Sc. Rotation 2 in Amsterdam | £924.3
European Commission

Teaching & Mentoring

01. 2020 – 07. 2020 Lucille Duquenoy, Master Thesis, Interdisciplinary Master's in Life Sciences, École Normale Supérieure - PSL Université Paris
01. 10. 2018 – 12. 10. 2018 Teaching Assistant for the Experimental Neuroscience Course on Fundamentals of Electrophysiology, part of the SWC-PhD Programme
10. 2017 – 09. 2018 Sarah F. Olesen, Master Thesis, M.Sc. Neuroscience, University College London
- Summer Semester 2014 Organised and coordinated a weekly Journal Club on Learning and Memory for the M.Sc. Neurosciences at the GSN-LMU in Munich

Skills & Competences

Technical skills	Loose-seal and whole-cell patch clamp recordings in acute brain slices. Single-cell RNA sequencing from manually aspirated cells via patch pipettes. Two-photon laser scanning microscopy, photoactivatable GFP tracing. Simultaneous patch-clamp recordings and calcium imaging in acute brain slices. Optogenetics, behavioural and pharmacological assays, stereotaxic surgeries. Confocal microscopy, cryostat and vibratome slicing, immunohistochemistry. Molecular biology (PCR, DNA/RNA extraction, western blot, electrophoresis). Animal models: rat, mouse, zebrafish, catfish, <i>Drosophila</i> , leech, <i>Xenopus laevis</i> .
Programming skills & Software	Python for electrophysiology data analysis. R and Bioconductor for single-cell RNA sequencing data analysis. MATLAB for data analysis, <i>in silico</i> screening for <i>Drosophila</i> transgenic lines, and registration of larval zebrafish brain stacks and mouse brain sections. LabView, Axograph, IGOR Pro, and pCLAMP for electrophysiology. PrairieView, ScanImage, and Neuroplex-IDL for calcium imaging and two-photon microscopy.
Languages	Native in Catalan and Spanish Proficient in English (CAE Grade B), Basic German (A2)

Writing & Editing

07. 2017 – 08. 2018	Section editor at Bright Brains , newsletter by the British Neuroscience Association
10. 2016 – 06. 2019	Page editor at Bright Brains , newsletter by the British Neuroscience Association
06. 2018	Official blogger for the 2018 UCL Neuroscience Symposium
06. 2017	Official blogger for the 2017 UCL Neuroscience Symposium
05. 2016	Finalist at YabberXDivulgame , a science writing and communication competition
10. 2015 – present	Blogger at La Neurona Errant A neuroscientist point of view I have also collaborated with and written at Neuromag , Phenotype , Principia , GSN Munich , SharpMinds , and En Clave Biomédica
07. 2015 – 02. 2017	Page editor at Phenotype , Journal of the Oxford University Biochemical Society
09. 2014 – 11. 2015	Member, Science Communicator and Web Designer of Asociación Juvenil de Biomédicos (UAB) – En Clave Biomédica
05. 2007	Finalist at Ficcions , a writing competition for High School students

Additional courses

4-24. 06. 2019	Ion Channels in Synaptic and Neural Circuit Physiology <i>Cold Spring Harbor Laboratory, New York, US</i>
8-12. 04. 2019	RNA-Sequence Analysis <i>EMBL European Bioinformatics Institute, Wellcome Genome Campus, Hinxton, UK</i>
23-30. 06. 2018	Cell Types, Coding and Cognition: neuronal connectivity and functional activity <i>Neuroscience School of Advanced Studies, Venice, Italy</i>
10. 2015 – 12. 2015	Introduction to Programming with MATLAB, <i>Vanderbilt University via Coursera</i>
03. 2013 – 07. 2013	Synapses, Neurons and Brains, <i>Hebrew University of Jerusalem via Coursera</i>
Winter 2012	Drugs and the Brain, <i>California Institute of Technology via Coursera</i>
07. 2011	“The Neurodegenerative Disease” and “Stem Cells: from theory to clinics” Two 20-hour Courses, <i>III University of Barcelona International Summer School, Spain</i>

Extracurricular activities

- 11. 2018 – 09. 2019 Co-organised the first GCNU-SWC PhD Student Retreat, *London, UK*
- 09. 2018 – 08. 2019 President of the University of London Judo Club, *London, UK*
- 03. 2018 – 10. 2018 Co-organised the 2018 NEUREka! and SWC joint [Symposium](#): “What is the quantum of neural computation?”, *London, UK*
- 03. 2018 – 09. 2018 Co-organised the 2018 [SWC Systems Seminar](#): “Cross-Species Conversations: integrating findings across nervous systems”, *London, UK*
- 09. 2017 – 08. 2018 Treasurer of the University of London Judo Club, *London, UK*
- 13. 07. 2013 Judo black belt 2nd DAN, *Real Federación Española de Judo y Deportes Asociados*
- 07. 2012 Volunteer staff at the 8th FENS Forum of Neuroscience, *CCIB, Barcelona, Spain*
- 06. 2008 Physis 2008, 1st Physics Summer Camp, *University of Barcelona, Spain*
- 1994 – 2007 Clarinet player and music student at *Music School of Sant Joan de Vilatorrada, Spain*