

Raquel Adaia Sandoval Ortega

Scientific software and product development for preclinical research

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PROFILE

Neuroscientist developing acquisition and analysis software for preclinical research. First author of AxoDen and co-owner of NeuroQP, an imaging platform in development. I connect experimental requirements, hardware, Python workflows and researcher feedback to build useful scientific tools.

SCIENTIFIC PRODUCTS & WORKFLOWS

NeuroQP | Co-owner | 2026–present | In development

Quantitative imaging workflow combining atlas registration, cell detection/classification and regional reporting.

AxoDen | Developer | Open source | Peer-reviewed method

Axonal-density quantification from microscopy images, delivered through web, desktop and Python interfaces. First-author publication in eNeuro (2025).

MultiCam Recorder & Multimodal Recorder | Developer

Public multi-camera GUI for up to six Basler/USB cameras, live preview and scheduled recording. Private multimodal acquisition system coordinating miniscope imaging, behavioural video and electrophysiology with TTL alignment and experiment metadata.

Multimodal Data Processing Suite | Developer | Private repository

Desktop workflow for verified data transfers, neural/cardiac signal processing, assisted sleep scoring, manual review and visualisation.

Von Frey Up-Down Analysis & COMPASS Activity Analysis | Developer

Public Python tools for assay thresholds, longitudinal/pre–post comparisons, activity-bout analysis, group statistics and figure export.

Video Processing Tools | Developer | Public, in development

Video segmentation, timestamp-based snippets, cropping, brightness adjustment and metadata checks.

Explore projects, public repositories and private project summaries

RESEARCH & DELIVERY EXPERIENCE

Postdoctoral Researcher | Corder Lab, University of Pennsylvania | 2023–present

Coordinate experimental design, hardware integration, acquisition, computational analysis and reporting; mentor undergraduate and rotation students. Develop multimodal workflows for preclinical pain and sleep research. Conceptualised, designed and wrote funded NIH proposal R21NS145093; PI: Gregory Corder.

PhD Researcher | Nevian Lab, University of Bern | 2018–2023

Established the laboratory's pain–sleep electrophysiology workflow, spanning recording protocols, data organisation and Python analysis of neural, cardiac and behavioural measurements. Supervised a master's researcher.

Visiting Scholar | Donders Institute, Radboud University | 2022

Advanced neural time-series analysis with Michael X Cohen, supported by a University of Bern mobility grant.

Master's Thesis Research & Research Assistant | EPFL | 2014–2017

Developed MATLAB-based automated quantification of hippocampal projections, later expanded into AxoDen.

TECHNICAL & SCIENTIFIC EXPERTISE

Software: Python, MATLAB, C++, SQL; modular pipelines, GUI/web/CLI interfaces, structured metadata, documentation and automated testing.

Methods: Microscopy, calcium imaging, electrophysiology, EEG/EMG, ECG, sleep phenotyping, behavioural analysis and longitudinal experiments.

Analysis: Repeated-measures and mixed-effects models, multiple-comparison correction and applied machine learning for behavioural classification, pose estimation and segmentation.

LEADERSHIP & EDUCATION

Co-chair, 2026 Gordon Research Seminar on Sleep; designed and taught a seven-session Python workshop (2024). Founder/president, Neuro Meetups Bern, with 20+ seminars; former president, young Swiss Society for Neuroscience; co-founder and Program Committee lead, Ciencia con Acento.

PhD Neuroscience — University of Bern, 2023.

Joint MSc Neuroscience — Strasbourg/Freiburg/Basel, 2016; thesis at EPFL.

Licenciatura Biology — University of Barcelona, 2012.

Languages: Spanish/Catalan native; English fluent; German/Swiss German proficient; French advanced.