

JIM MCBURNEY-LIN, PHD

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SUMMARY

PhD neuroscientist and applications scientist with five years of industry experience designing rigorous, quantitative evaluation frameworks for complex biological and biomedical data. Track record of five first-author peer-reviewed publications built on independent, first-principles experimental design in ambiguous, previously unsolved problem spaces. Comfortable moving between hands-on biological research, cross-functional engineering collaboration, and the detail-heavy, high-rigor work of building datasets and criteria others will build on.

RELEVANT STRENGTHS

- **Benchmark & Evaluation Design:** Defined quantitative, reproducible metrics (signal fidelity, reproducibility, repeatability) for novel biological measurement platforms with no established ground truth – the same core problem as building rigorous benchmarks for a new capability.
- **Scientific Judgment:** Five years distinguishing genuine biological signal from artifact, noise, and pattern-matching false positives, across in vivo neural recordings, imaging, and molecular assays; trained to interrogate whether a result reflects real mechanism or a shortcut.
- **Python & Data Workflows:** Built and maintained Python pipelines that turn raw, messy, high-dimensional experimental data into structured, decision-driving outputs; working knowledge of R, MATLAB, and SQL.
- **Foundational ML/DL Exposure:** Graduate coursework in Special Topics in Biocomputation (drift diffusion, hidden Markov, and Bayesian inference models); Neuromatch Academy Computational Neuroscience certificate (inaugural cohort); Kaggle coursework in Intro to Machine Learning, Intermediate Machine Learning, and Intro to Deep Learning. Comfortable reading ML literature and collaborating with ML researchers on scientific reasoning tasks.
- **Documentation & Cross-Functional Coordination:** Authored reproducible experimental protocols, SOPs, and error-tracking frameworks used by biology, engineering, and software teams; managed multiple concurrent validation workstreams against deadlines.

WORK EXPERIENCE

Bruker Spatial Genomics

San Jose, CA

Senior Applications DVT Engineer

December 2023 to Present

- Own experimental design and execution for system-level validation of automated imaging and microfluidic platforms – defining quantitative pass/fail criteria and scoring rubrics (signal fidelity, reproducibility, repeatability).
- Build Python-based analysis pipelines that transform raw imaging and fluidic signal data into structured, decision-driving performance metrics, informing hardware and software redesign cycles.
- Author reproducible validation protocols, annotation criteria, and error-tracking frameworks adopted across biology, engineering, and software teams – improving reliability and shortening development cycles in a fast-moving, cross-functional environment.

Akoya Biosciences

Menlo Park, CA

Scientist I, Scientist II

April 2022 to December 2023

- Designed and validated signal-quality and imaging-fidelity scoring pipelines for the PhenoCycler Fusion platform, establishing quantitative, reproducible criteria for data integrity on a high-throughput biological signal acquisition system.
- Engineered and automated high-throughput staining and whole-slide imaging workflows, accelerating assay development while maintaining rigorous quality control and documentation.
- Built custom automation routines that reduced hands-on time and increased throughput, supporting faster iteration between assay design and validation.

University of California Riverside

Riverside, CA

Graduate Researcher

September 2016 to March 2022

- Independently designed and led five first-author, peer-reviewed in vivo studies (electrophysiology, optogenetics, pharmacology).
- Applied rigorous statistical and experimental controls to distinguish genuine neural/behavioral signal from noise, artifact, and confounds across multi-modal datasets (electrophysiology, pupillometry, behavior, histology).
- Analyzed high-dimensional, multi-modal datasets in Python and R, building reusable analysis code and clearly documenting methodology for reproducibility by other lab members.

EDUCATION

- PhD, Neuroscience, University of California Riverside, 2022
- BS, Physiology and Neuroscience, University of California San Diego, 2014
- Computational Neuroscience Certificate, Neuromatch Academy, 2020 (inaugural cohort)
- Machine Learning Coursework, Kaggle: Intro to Machine Learning, Intermediate Machine Learning, Intro to Deep Learning

AWARDS

- Chancellor's Distinguished Fellowship (UCR, 2016)
- James and Margaret Lesley Annual Prize in Biology (UCR, 2022)

PUBLICATIONS

- **McBurney-Lin, J.**, Lu, J., Zuo, Y., Yang, H. (2019). Locus coeruleus-norepinephrine modulation of sensory processing and perception: A focused review. *Neuroscience and Biobehavioral Reviews*, 105, 190-199.
- Megemont, M. *, **McBurney-Lin, J. ***, Yang, H. (2022). Pupil diameter is not an accurate real-time readout of locus coeruleus activity. *eLife*, 11, e70510.
- **McBurney-Lin, J. ***, Sun, Y. *, Tortorelli, L.S., Nguyen, Q.A.T., Haga-Yamanaka, S., Yang, H. (2020). Bidirectional pharmacological perturbations of the noradrenergic system differentially affect tactile detection. *Neuropharmacology*, 174, 108151.
- **McBurney-Lin, J. ***, Vargova, G. *, Garad, M., Zagha, E., Yang, H. (2022). The locus coeruleus mediates behavioral flexibility. *Cell Reports*, 41(4), 111534.
- Tortorelli, L.S., **McBurney-Lin, J.**, Garad, M., Megemont, M., Riccomagno, M., Yang, H. (2022). Physiological and functional heterogeneity in the mouse locus coeruleus. *bioRxiv*, 2022.08.19.504582.
- Megemont, M., Tortorelli, L.S., **McBurney-Lin, J.**, Cohen, J. Y., O'Connor, D.H., Yang, H. (2024). Simultaneous recordings of pupil size variation and locus coeruleus activity in mice. *STAR Protocols*, 5 (1), 102785.

*denotes co-authorship