

Junda Zhu, Ph.D.

Clinical Scientist | Neurophysiology & Clinical Research

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PROFILE

Clinical scientist with end-to-end experience running human-subjects research in hospital settings (bedside, OR, and online), spanning electrophysiology and clinical imaging (MRI, CT). I own studies from protocol design through IRB, acquisition, QC, analysis, and reporting, collaborating closely with surgeons, neurologists, and engineers. Hands-on with pre-release recording devices in the clinical environment, including beta-testing next-generation probes and reporting usability and signal-quality findings to the manufacturer. Strong regulatory grounding (GCP, IRB/HSR) and a record of translating technical results into clear evidence for clinical, engineering, and regulatory stakeholders.

Areas of expertise: Human & NHP electrophysiology · Structural & functional neuroimaging (MRI, CT, DTI/fMRI) · Clinical research operations · Pre-release device evaluation · Regulatory (GCP, IRB/HSR) · Behavioral task design · Signal QC & analysis · Cross-functional scientific communication · Project management

IMPACT & CONTRIBUTIONS

- **Pre-release device evaluation:** beta-tested next-generation *laminar* recording probes in NHP models (Vanderbilt) and human intraoperative research (Cedars-Sinai); delivered structured feedback on signal quality, insertion approach, and drape/sterilization integration to the manufacturer.
- **Reliable bedside & OR data capture:** support ~15 bedside patients and ~10 intraoperative sessions; standardized setup/checklists for stable signal acquisition and smooth sterile-field workflow.
- **Full study ownership:** designed, coded (Python/JS), deployed, recruited, budgeted, and analyzed cognitive/memory/decision-making studies; collected data from 100+ *participants* (patients & healthy controls) across in-person and online settings.
- **Clinical & regulatory operations:** coordinated IRB submissions/amendments; adhered to GCP/HSR and site SOPs; contributed to site start-up readiness and onboarding/training documentation.
- **Reproducible analysis:** standardized analysis repositories and runbooks; open-sourced a utility library on GitHub to reduce reruns and speed iteration.
- **Communication & grant enablement:** produced figures/briefings for multidisciplinary teams; contributed preliminary datasets supporting successful NIH R01 applications.
- **Mentorship & training:** trained undergraduate and graduate students and authored onboarding SOPs/quick-start guides.

SKILLS & TOOLS

Clinical Ops & Regulatory	IRB, GCP/HSR (CITI), AE reporting, site start-up & training, SOPs/checklists
Neuroimaging	Structural & functional MRI, CT; DTI; AFNI, FreeSurfer; electrode localization & anatomical targeting; longitudinal analysis
Neural Data & Analysis	Python, MATLAB, R (10+ yrs); pandas, scikit-learn, PyTorch; SVM/LDA/RNN; dPCA/GAM/mixed-effects; code on GitHub
Experiment Design	Psychtoolbox, PsychoPy/Pavlovia; Cedrus control module; Arduino; eye-tracking
Acquisition & Hardware	Blackrock NeuroPort/CerePlex; Neuralynx; Open Ephys; Neuropixels; Brainsight Vet neuronavigation; NI DAQ; eye-tracking

EXPERIENCE

Postdoctoral Scientist, Department of Neurosurgery · Cedars-Sinai Medical Center, Los Angeles, CA · 2024–Present
Lead scientist for human intracranial research studies: protocol design, IRB, bedside/OR acquisition, and analysis.

- Built and deployed a cognitive-control study (unpublished) for bedside/OR and online use; integrated Cedrus hardware, bilingual prompts, quick practice flow; run across ~15 bedside patients and ~10 intraoperative sessions plus 100+ online participants.
- Beta-tested next-generation *laminar* probes in NHP and human intraoperative settings; delivered usability and signal-quality feedback (insertion angle, impedance/QC checks, sterile-field workflow) to the manufacturer.
- Authored SOPs/checklists and pre-op drills; coordinated IRB submissions and amendments; prepared concise data briefs for clinical and engineering teams.
- Standardized Python/MATLAB analysis, repositories, and runbooks; built and open-sourced a utility package for reuse and reproducibility.

Postdoctoral Fellow, Biomedical Engineering · Vanderbilt University · 2024

- Programmed and operated Brainsight Vet neuronavigation/robotic guidance for nonhuman-primate procedures; planned targets/trajectories and integrated with task workflows.

Ph.D. Candidate, Neuroscience · Vanderbilt University · 2021–2024

Large-scale neurophysiology; adolescent development of working memory; longitudinal imaging; statistical modeling; mentorship.

- First-author and collaborative publications (Nature Neuroscience 2025; iScience 2024; J Neurophysiol 2023); reproducible pipelines; mentored undergrad/grad students.

Ph.D. Candidate, Neuroscience · Wake Forest University School of Medicine · 2018–2021

Research Assistant, Neurobiology · Southern University of Science and Technology · 2015–2018

EDUCATION & CERTIFICATIONS

- **Ph.D., Neuroscience** · Vanderbilt University, 2024
- **B.S., Bioinformatics** · Southern University of Science and Technology, 2018
- **CITI Program** · GCP (2024–2027); Biomedical Investigators & Key Personnel/HSR (2024–2034); Conflicts of Interest (2024–2028)
- **HIPAA** · Privacy & Security Training (current)
- **Google Project Management Certificate**

PEER-REVIEWED PUBLICATIONS

[Google Scholar]

- Mozumder, R., Wang, Z., Dang, W., **Zhu, J.**, Hammond, B.M., Machado, A., et al. *Asynchronous firing and off states in working memory maintenance*. Cell Reports, 45(1), 2026.
- **Zhu, J.**, Garin, C.M., Qi, X.-L., Machado, A., Wang, Z., Hamed, S.B., Stanford, T.R., Salinas, E., Constantinidis, C. *Longitudinal measures of monkey brain structure and activity through adolescence predict cognitive maturation*. Nature Neuroscience, 2025.
- **Zhu, J.**, Zhou, X.M., Constantinidis, C., Salinas, E., Stanford, T.R. *Parallel signatures of cognitive maturation in primate antisaccade performance and prefrontal activity*. iScience, 2024.
- **Zhu, J.**, Hammond, B.M., Zhou, X.M., Constantinidis, C. *Laminar pattern of adolescent development changes in working memory neuronal activity*. Journal of Neurophysiology, 2023.
- Han, P., She, Y., Yang, Z., Zhuang, M., Wang, Q., Luo, X., Yin, C., **Zhu, J.**, et al. *Cbln1 regulates axon growth and guidance in multiple neural regions*. PLOS Biology, 2022.
- Liu, Y.H., **Zhu, J.**, Constantinidis, C., Zhou, X. *Emergence of prefrontal neuron maturation properties by training recurrent neural networks in cognitive tasks*. iScience, 2021.
- Zhuang, M., Li, X., **Zhu, J.**, Zhang, J., Niu, F., Liang, F., Chen, M., Li, D., Han, P., Ji, S.J. *The m6A reader YTHDF1 regulates axon guidance through translational control of Robo3.1 expression*. Nucleic Acids Research, 2019.
- Yu, J., Chen, M., Huang, H., **Zhu, J.**, Song, H., Park, J., Ji, S.J. *Dynamic m6A modification regulates local translation of mRNA in axons*. Nucleic Acids Research, 2018.

EDITORIAL & PROFESSIONAL ROLES

- **Editor** · The Innovation Life journal · 2024–Present
- **Editorial Board Member** · American Journal of Biomedical and Life Sciences · 2024–Present
- **Reviewer** · Imaging Neuroscience · 2026–Present
- **Reviewer** · Experimental Brain Research · 2026–Present
- **Reviewer** · Frontiers in Computational Neuroscience · 2024–Present
- **Reviewer** · Journal of Neurophysiology · 2020–Present
- **Member** · Society for Neuroscience · 2021–Present

PRESENTATIONS & POSTERS

- Maturation trajectories of cognitive and prefrontal activity in adolescence. Johns Hopkins University, Jan 2024.
- Working memory development in adolescent macaques. Working Memory Symposium 2023, May 2023.
- Neuronal activity changes in the macaque prefrontal cortex during adolescence. Society for Neuroscience, Nov 2022.
- Structural brain changes of the macaque brain during adolescence. Society for Neuroscience, Nov 2022.
- Precision of visuospatial working memory reports in adolescent monkeys. Society for Neuroscience, Nov 2022.
- NMDA dependence of serial biases in working memory. CRCNS PI Meeting, Oct 2022.
- Prefrontal neural changes in early adolescence related to working memory. Society for Neuroscience, Nov 2021.
- Working memory and prefrontal neural activity of macaques in early adolescence. Vision Sciences Society, May 2021.