Rachel Fox

rachelfox@ucla.edu | Los Angeles, CA

Education

University of California, Los Angeles
B. S. Neuroscience, Class of 2025, GPA: 3.99, MCAT: 517

Work Experience

Undergraduate Researcher, UCLA Neurotrauma Imaging Lab under Principal Investigator Dr. Neil Harris (November 2021-Present)

- Led project analyzing functional connectivity and injury with EEG analysis, gamma event coupling and broadband correlation, and network-based statistics
- Leading data harmonization project using the ComBat algorithm and R to analyze the effectiveness of pooling MRI data across sites and optimizing multi-site injury biomarker analysis; preparing for co-first author publication
- Investigating dynamic functional connectivity changes after brain injury using python-based algorithmic analysis of mathematically determined brain states, in addition with community structure and gradient analysis methods
- Conducting behavioral experiments in mice using 2-choice discrimination tasks, functional ultrasound imaging, and statistical analysis to understand decision-making and cortical circuitry changes after traumatic brain injury and cerebellar perturbation
- Complete data analysis in mouse behavioral experiments to understand changes in cognitive flexibility and inhibitory behavior after TBI
- Attend, participate, and present in twice-weekly lab meetings

Clinical Research Support Assistant, Cedars Sinai Department of Neurology under Principal Investigator Dr. Adam Mamelak (October 2023-Present)

- Managing and conducting manual chart review using electronic medical records, patient data querying and manipulation, and data coding for the transition of 20 years of pituitary adenoma surgical data from over 400 patients to a multi-site database for use in retrospective and prospective studies
- Assist in operation of a clinical trial imaging device during craniotomy surgery, collection of tumor biopsies, and data entry in phase II clinical trial for glioblastoma removal
- Co-leading project evaluating the efficacy of the phase II clinical trial through examination of extent of resection based on MRI imaging, predictive accuracy of the study drug, fluorescence quantification, and statistical correlation with pathology
- Validate automatic retrieval of patient information and manual chart review of surgical data for creation of a national pituitary adenoma registry databases
- Leading project analyzing outcomes of measures of fibrosis, remission, and tumor volume to evaluate the impact the drug cabergoline used to treat prolactin-secreting pituitary tumors has on the efficacy of subsequent surgery on those same tumors

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Medical Clinic Assistant, Elihu Institute for Pain Management (Summer 2023)

- Assisted during in-office procedures using fluoroscopic guidance aimed to relieve chronic pain: cervical, sacroiliac, and lumbar epidural steroid injections, nerve blocks, shoulder and knee corticosteroid injections, prolotherapy
- Prepared sterile instruments/medications and positioned patients prior to each procedure, adjusted fluoroscopic imaging during procedures to better visualize therapeutic targets
- Maintained clinic workflow by rooming patients and recording medical histories for new and returning patients prior to each appointment
- Completed administrative duties of scheduling appointments and making phone calls to patients

Cedars Sinai Transforming Care At Bedside Volunteer (February 2023-June 2024)

- Improve patient experience as a volunteer in the orthopedic department through conversation, bringing amenity and care items, and assisting patients during their hospital stay
- Assist nurses and clinical staff in administrative and non-medical duties

Research Intern, *Marbán Lab at Cedars Sinai Smidt Heart Institute (Summer 2022)*

- Assisted in projects analyzing the potential for microRNA TY4 to be used as a therapy for hypertrophic cardiomyopathy and scleroderma
- Performed wet lab techniques including hypodermal injections on mice, echocardiograms, genotyping, cell culture maintenance, and RNA isolation
- Performed data analysis on sectioned heart microscope images, RNA sequencing, echocardiogram images, and physiological data

Job shadow with orthopedic surgeon Dr. Kevin Nadel, Providence Medical Institute Center for Orthopedic Specialists (Summer 2021)

- Observed a shoulder SLAP repair surgical procedure
- Observed diagnosis and treatment of patients in a clinical setting

Job Shadow with neurologist Dr. Lorne Label, Southern California Vascular Neurology (Summer 2021)

- Observed diagnosis and treatment of patients in a clinical setting

Awards and Scholarships

- UCLA Life Science Dean’s Award Schiebel Scholarship for Neuroscience Research, 2023-2024 School Year and 2024-2025 School Year
- National Neurotrauma Society 2023 Conference Award for Top 20 Trainee Abstracts
- National Neurotrauma Society 2023 Travel Scholarship Award and Data Blitz Presentation
- Western Neurotrauma Symposium 2023 Young Investigators Award and Data Blitz Presentation

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Publications and Presentations

- Orcid ID: https://orcid.org/0009-0002-2977-0861
- Fox R, Santana-Gomez C, Shamas M, Pavade A, Staba R, Harris NG. Different Trajectories of Functional Connectivity Captured with Gamma-Event Coupling and Broadband Measures of EEG in the Rat Fluid Percussion Injury Model. bioRxiv [Preprint]. 2024 Jun 3:2024.06.02.597056. doi: 10.1101/2024.06.02.597056. PMID: 38895342; PMCID: PMC11185526. Accepted to *Journal of Neurotrauma Reports*, in press
- Jones XM, Fox R, Motawakel J, Trivedi RK. Reversal of right ventricular pressure loading improves function independent of fibrosis. J Physiol. 2023 Feb;601(3):397-399. doi: 10.1113/JP283580. Epub 2022 Dec 31. PMID: 36524593.
- Fox R, Santana-Gomez C, Shamas M, Parikh K, Staba R, Harris NG. Electrographic Measures of Functional Connectivity May Reflect Different Neural Processes After Fluid Percussion Injury, Abstracts from The 40th Annual Symposium of the National Neurotrauma Society June 25–28, 2023 Austin, Texas, USA. Journal of Neurotrauma 2023;40(15–16):A-1; doi: https://doi.org/10.1089/neu.2023.29130.abstracts.
- Fox R, Paydar A, Azargushasb A, Vander Dussen S, Harris NG. Dynamic versus Static Functional Network Analysis after Rodent TBI, Poster presented at: 41st Annual Symposium of the National Neurotrauma Society June 9-12, 2024 San Francisco, California, USA.
- Kislik G, Fox R, Korotkov A, Zhou J, Febo M, Koehler RC, Burns B, Huie JR, McCabe J, Ferguson AR, Wang KK, Wanner I, Harris NG. Multi-Site NeuroCombat Harmonization of Neuroimaging Data after Rat CCI Injury, Poster presented at: 41st Annual Symposium of the National Neurotrauma Society June 9-12, 2024 San Francisco, California, USA.
- Presentation of original research and future directions for projects studying Static and Dynamic Functional Connectivity after TBI, UCLA Brain Injury Research Center meeting March 5, 2024
- National Neurotrauma Society 2023 Data Blitz Presentation and Western Neurotrauma Symposium 2023 Data Blitz Presentation: Electrographic Measures of Functional Connectivity May Reflect Different Neural Processes After Fluid Percussion Injury

Extracurricular Activities

UCLA Learning Assistant Program (January 2023-June 2024)

- Encourage peer collaboration within the life sciences department by assisting TAs during Mathematics for Life Sciences lab sections and teaching undergraduate students Python and linear algebra applicable for the life sciences
- Facilitate content meetings and discussion sections as pedagogy Head LA for Genetics course by conveying topics from pedagogy seminars and weekly Head LA meetings
- Effectively explain coding and linear-algebra concepts to students by implementing core pedagogical techniques (including redirecting questions, checking for understanding, using student names) practiced in weekly lab sections and content meetings, and revising techniques based on feedback

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- Created and led programming and exam review sessions by coordinating learning and teaching assistants, making slides and practice worksheets, and presenting to over 300 student attendees across multiple quarters

UCLA Happy Feet Clinic Club Member (2022-Present), Data Entry Chair (2023-Present)

- Participate in bi-quarterly health fairs and podiatry clinics for unhoused individuals in Los Angeles by educating patients on podiatry care, washing patients' feet, providing shoes and personal hygiene items, and assisting in running clinic
- Manage patient data collection at clinics and create data presentations to use for clinic improvement
- Assist in the creation of clinic procedure forms, intake forms in English and Spanish, and informational pamphlets

UCLA InterAxon Member (2022-Present)

- Create and deliver presentations about neuroscience topics to elementary, middle, and high school students from schools in Los Angeles that are underfunded in the sciences

UCLA CruX Neurotechnology Club and Brain Computer Interface (BCI) Team Member (2021-2022)

- Created Python-based machine learning model to classify drowsiness using EEG signals
- Led and presented project at 2022 UCLA Undergraduate Research Week Showcase

UCLA Club Softball Team Member (2021-Present) and Safety Officer (2023-Present)

Relevant Skills

- Proficiency in R, Python, and MATLAB coding languages
- Proficiency in navigation and use of Epic Electronic Medical Record software, MRI imaging analysis, ImageJ, and REDCap
- Experience in mouse and rat handling, mouse intraperitoneal and hypodermal injections, functional ultrasound imaging, and rodent perfusion and histology