

Zechuan Shi

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GitHub: <https://github.com/rootze>

EDUCATION

Ph.D. Student in Bioinformatics

Expected 2026

University of California, Irvine, Department of Neurobiology and Behavior

Principal Investigator: Dr. Vivek Swarup

Research Direction: Bioinformatics, Genomics, GWAS, Single Cell, Big Data, Alzheimer's Diseases

Master of Science in Biotechnology

Sep 2016 – May 2018

Johns Hopkins University

GPA: 3.92

Concentration: Bioinformatics, Molecular Targets and Drug Discovery Technologies

SOFTWARE PACKAGE

Developer

- **ArchRtoSignac**: an R package that allows easier implementation of both ArchR and Signac scATAC-seq analysis pipelines

GitHub: <https://github.com/swaruplabUCI/ArchRtoSignac>

DOI: 10.5281/zenodo.7255601

Contributor

- **hdWGCNA**: an R package for performing weighted gene co-expression network analysis (WGCNA) in high dimensional transcriptomics data

GitHub: <https://github.com/smorabit/hdWGCNA/tree/dev>

FIRST/CO-FIRST AUTHOR PUBLICATIONS

- **Shi, Z.**, Das, S., Morabito, S., Miyoshi, E., & Swarup, V. (2022). Protocol for single-nucleus ATAC sequencing and bioinformatic analysis in frozen human brain tissue. STAR Protocols, 3(3), 101491. DOI: <https://doi.org/10.1016/j.xpro.2022.101491>.
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OTHER PUBLICATIONS

- Garcia-Agudo, L.F., **Shi, Z.**, et al. (2023). BIN1K358R suppresses glial response to plaques in mouse model of Alzheimer's Disease. (In Review)
- Miyoshi, E., Morabito, S., Henningfield, CM. [et al., including **Shi, Z.**]. (2023). Spatial and single-nucleus transcriptomic analysis of genetic and sporadic forms of Alzheimer's Disease. (In Review)
- Tiwari, V., Prajapati, B., Asare, Y. [et al., including **Shi, Z.**]. (2023). Innate immune training restores pro-reparative myeloid functions for remyelination in the aged central nervous system. (In Review)
- Tran, K.M., Kawauchi, S., Kramár, E.A. [et al., including **Shi, Z.**]. (2023). A Trem2R47H mouse model without cryptic splicing drives age- and disease-dependent tissue damage and synaptic loss in response to plaques. BioMed Central Mol Neurodegeneration. DOI: <https://doi.org/10.1186/s13024-023-00598-4>.
- Ma, Z., Flynn, J., Libra, G., & **Shi, Z.** (2018). Elevated CO₂ Accelerates Phosphorus Depletion by Common Bean (*Phaseolus vulgaris*) in Association with Altered Leaf Biochemical Properties. Pedosphere, 28(3), 422–429. DOI: 10.1016/S1002-0160(17)60420-X

PRESENTATION

- “Characterizing BIN1^{K358R} SNP rs138047593 effects in 5xFAD plaque pathology of Alzheimer's disease using snRNA-seq”. American Society of Human Genetics 2023, Washington DC Nov 2023 (Poster)
- “Single-nucleus open chromatin accessibility landscape of Pick's and Alzheimer's disease”. Alzheimer's Association International Conference 2022, San Diego CA July-August 2022 (Talk)

PROFESSIONAL EXPERIENCE

Board Manager

Jul 2022 – Present

genPALs and UCI GPS – STEM Data Science Cohort, Irvine, CA

- Organized bi-weekly seminars to promote the research in genomics and epigenomics
- Foster connections with invited speakers and industry professionals
- Coordinate with board members to organize professional networking events
- Collaborate with UCI consulting and business clubs to spread awareness of data science

Preclinical Research Specialist

Jul 2018 – Jul 2020

University of Pennsylvania, Philadelphia, PA

Project: Recurrent Breast Cancer Preclinical Drug Development

- Conducted 4 different preclinical drug studies of HER2-positive breast cancer on the MTB/TAN bi-transgenic mouse model with a high risk of recurrence
- Performed RNA-Seq analysis, including FASTQC and STAR sequencing analysis, to identify the tumor residues from normal cells and find potential prognostic markers for disseminated tumor cells

TEACHING EXPERIENCE

Graduate Teaching Assistant

Mar 2022 – May 2022

University of California, Irvine, CA

Classes: Bio 38: Mind, Memory and Brain; N 138: Sex Influences on Brain

- Graded 200+ students' writing assignments and exams
- Facilitated in-class discussion sections and answered students' questions

Cell Biology Teaching Assistant

Aug 2013 – Dec 2014

Truman State University, MO

Advisor: John Ma, Ph.D.

- Collected and analyzed biological data from student weekly lab classes and assisted professors in preparing lab materials
- Interpreted research findings from 2 lab sessions every semester and helped students summarize data into reports
- Assisted 100+ students with their lab assignments and verified their operation procedures