

Kunming Shao

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EDUCATION

B.S. Purdue University, West Lafayette, IN **2017 - 2021**
Major: Biological Engineering / Cellular and Biomolecular Engineering
Minor: Biotechnology

Ph.D Candidate Purdue University, West Lafayette, IN **2022 - Present**
Purdue University Interdisciplinary Life Science Program (PULSe)
Department of Biological Sciences
Major - Computational and Systems Biology

PUBLICATIONS

Shao, K., Liang, Z., & Shen, J. (2026). Chemically defined production of CAR-neutrophils from human pluripotent stem cells [Manuscript submitted for publication]

Chang, Y., **Shao, K.**, & Li, H. (2026). CAR-neutrophils produced in vivo to treat glioma. Nature Biomedical Engineering. Advance online publication. <https://doi.org/10.1038/s41551-026-01656-0>.

Luong, N. H., **Shao, K.**, Duong, V. T., Bao, X., & Lin, C. C. (2026). Photo-click Decellularized Matrix Hydrogels for Generating Pancreatic Ductal Organoids. bioRxiv, 2026-02.

Chiu, H. H., Varghese, A., **Shao, K.**, Lu, Y. C., Nahar, R., Chen, H., ... & Li, C. (2024). scChat: A large language model-powered co-pilot for contextualized single-cell RNA sequencing analysis. AIChE Journal, e70285.

Wang, T., Kim, D. H., Ding, C., Wang, D., Zhang, W., Silic, M., ... & Deng, Q. (2025). Inwardly rectifying potassium channels promote directional sensing during neutrophil chemotaxis. Journal of Cell Biology, 225(1), e202503037.

Yan, B, Wang, C, Chakravorty, S, et al. A comprehensive single cell data analysis of lymphoblastoid cells reveals the role of super-enhancers in maintaining EBV latency. J Med Virol. 2022; 95:e28362. doi:10.1002/jmv.28362.

RESEARCH EXPERIENCE

- **Graduate Research Assistant.**

Research Associate, Advisor: Dr. Qing Deng, Department of Biological Science

April 2023 – Present

- Elucidated microRNA-mediated regulatory networks governing the development and effector functions of iPSC-derived neutrophils
- Refined and scale up the iPSC-to-neutrophil differentiation pipeline to enhance cell yield, purity, and functional maturity

Research Associate, Co-Advisor: Dr. Xiaoping Bao, Department of Chemical Engineering

April 2023 – Present

- Engineered neutrophil-like cells via nanoparticle-mediated delivery of modRNA
- Integrated machine learning pipelines to guide the rational design and optimization of CAR-engineered iPSC-neutrophils

- **Undergraduate Research Assistant.**

Research Associate, Advisor: Dr. Majid Kazemian, Department of Biochemistry

August 2019 – Dec 2021

- Working on the novel noncoding RNA in viral associated cancers

- **Undergraduate Research Assistant.**

Research Associate, Advisor: Dr. Luo Zhaoqing, Department of Biological Sciences

Dec 2018 – Dec 2019

- Study the mechanisms of how *L. pneumophila* modulates apoptotic pathways to promote its intracellular growth.

HONORS AND AWARDS

- Recipient of the Lynn Fellowship 2022
- Recipient of the 2021-2022 Ladisch ABE Scholarship 2021
- Recipient of the 2020-2021 Alumni & Friends of ABE Scholarship 2020
- Purdue Soybean Innovation Competition Award 2020
- Dean's List and Semester Honors, College of Engineering 2018 – 2021

SKILLS

- **Programming:** Python, R, MATLAB, SQL, Linux/Unix Shell Scripting (Bash), LaTeX, ImageJ Macro, VBA, Git
- **Software:** FlowJo, FIJI/ImageJ, IGV, JMP, Jupyter Notebook, Google Colab, GraphPad Prism, Seurat, Scanpy, Cell Ranger, DESeq2, QuPath, Cellpose, DNA Master
- **Molecular and Cellular Techniques:** PCR, qPCR, RT-qPCR, DNA/RNA extraction, molecular cloning, immunofluorescence (IF), immunohistochemistry (IHC), confocal microscopy, ELISA, gel electrophoresis, mammalian cell culture, CRISPR/Cas9-mediated mammalian cell gene knock-in and out, Nucleic Acid Engineering (modRNA/gRNA design, IVT synthesis, and structural/integrity QC), western blotting(WB), flow cytometry, FACS sorting, nanoparticle formulation and characterization, extracellular vesicle (EV)/exosome isolation and characterization
- **Stem Cells:** hPSC/iPSC differentiation & Organoid engineering (Establishment, 3D culture, and maintenance), CRISPR/Cas9-mediated gene knock-in at the AAVS1 safe harbor locus; Viral vector engineering (AAV & Lentivirus design, packaging, and transduction).
- **Omics:** bulk RNA-seq, ATAC-seq, ChIP-seq, single-cell RNA-seq (scRNA-seq) , library preparation, data processing and analysis
- **In vivo Animal Model:** *Mus musculus*; *Danio rerio*
- **Artificial Intelligence & Deep Learning:** TensorFlow, PyTorch, LLM application engineering (API integration, RAG workflows, and local model deployment for biological data analysis)