Joseph Erwin

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EDUCATION

University of Illinois Urbana-Champaign, Urbana, IL
Bachelor of Science in Biochemistry

- Graduated with highest departmental distinction in spring 2019
- GPA: 3.81/4

Yale University, New Haven, CT
Doctor of Philosophy in Molecular Biochemistry and Biophysics

- In progress

RESEARCH INTERESTS

Structural Biology, Biophysics, Biochemistry

PROFESSIONAL EXPERIENCE

Teaching Assistant for CHEM 101, University of Illinois Urbana-Champaign, Department of Chemistry, August 2018-December 2018

- Taught discussion and laboratory course components
- Tutored students from all first-year chemistry classes

Teaching Fellow for MCDB 105, Yale University, Department of Molecular Biochemistry and Biophysics, February 2021-May 2021, February 2022-May 2022

- Taught and designed lesson plans for weekly discussions

Teaching Fellow for MCDB 251, Yale University, Department of Molecular Biochemistry and Biophysics, February 2023-May 2023, February 2025-May 2025

- Taught undergraduate students basic biochemistry techniques

RESEARCH EXPERIENCE

Undergraduate Researcher, Jin Lab, University of Illinois Urbana-Champaign, Department of Biochemistry, August 2016-August 2019

- Assisted graduate students and post-doctoral students in their research
- Independently worked to design novel yeast strain for the Sbp1 project
- Designed and independently researched NatA as part of the NatA project

Research Traineeship, Flores Lab, Stockholm University, Department of Biochemistry and Biophysics, January 2018-June 2018

- Purified and characterized variants of human growth hormone as part of the HGH project

Graduate Student Researcher, Malvankar lab, Yale University, Department of Molecular Biophysics and Biochemistry, March 2020-Present

- Grew *Geobacter* in sterile anaerobic conditions
- Designed PhD project focused on understanding structure and function of the cytochrome OmcB in extracellular electron transport in *Geobacter.*
- Purified the OmcB complex from *Geobacter sulfurreducens*.
- Designed a project to characterize the localization and assembly of OmcZ filaments.

HONORS / AWARDS

MCB Summer Undergraduate Research Fellowship
University of Illinois Urbana Champaign, Summer 2017

William T. and Lynn Jackson Senior Thesis Award
University of Illinois Urbana Champaign, Fall 2016-Spring 2017, Spring 2019

NSF Graduate Research Fellowship Program Runner Up
Spring 2021

LABORATORY SKILLS

DNA: Trained in PCR, Mutagenesis PCR, Recombinant Plasmid Creation, Gel Electrophoresis, Bacterial Cell Transformation, and chromosomal DNA modification in Yeast cells.

RNA: Trained in In Vitro Translation, 5' RACE, Reverse Transcription, Purification of Cellular RNA, Bleach Gel Electrophoresis, Urea Gel Electrophoresis, Purification of Ribosomes, and Polysome Profiling.

Protein: Trained in Expression of Proteins in Bacterial Organisms, Expression of Proteins in Yeast, Expression and Purification of Recombinant Membrane Proteins and Cytochromes, Western blotting, and Polyacrylamide Gel Electrophoresis.

Spectroscopic Techniques: Trained in Quantification of Macromolecules via UV-Vis Spectroscopy, Identification of the Structure of Organic Molecules via NMR, and characterization of biological macromolecules via Nano Differential Scanning Fluorimetry, Circular Dichroism Spectroscopy, and Diffusion NMR.

Cell Culture Techniques: Trained to grow *E. coli*, S. *cerevisiae*, and *G. Sulfurreducens*.

PUBLICATIONS:

1. Rajkovic A, Kanchugal S, Abdurakhmanov E, Howard R, Wärmländer S, Erwin J, et al. (2023) Amino acid substitutions in human growth hormone affect secondary structure and receptor binding. PLoS ONE 18(3): e0282741. https://doi.org/10.1371/journal.pone.0282741

2. Srikanth V, Erwin J, Shen C, Salazar-Morales A, Shipps C, Ebru Yalcin S, Malvankar N. (2023) Widespread Periplasmic Microbial Nanowires of Cytochromes ExtA and OmcX involved in Extracellular Electron Transfer. *In review*
3. Joseph Erwin, Cong Shen et al. A widespread porin-cytochrome complex Om(abc)B kickstarts microbial respiration and nanowire formation, 21 November 2024, PREPRINT available at Research Square [https://doi.org/10.21203/rs.3.rs-5369439/v1]
4. Shen C, Salazar-Morales AI, Jung W, Erwin J, Gu Y, Coelho A, Gupta K, Yalcin SE, Samatey FA, Malvankar NS. A widespread and ancient bacterial machinery assembles cytochrome OmcS nanowires essential for extracellular electron transfer. Cell Chem Biol. 2025 Feb 20;32(2):239-254.e7. doi: 10.1016/j.chembiol.2024.12.013. Epub 2025 Jan 15. PMID: 39818215; PMCID: PMC11845295.

REFRENCES:

- Dr. Nikhil Malvankar: Assistant Professor of Molecular Biophysics and Biochemistry at Yale University. Phone +1(203) 737-7590 | nikhil.malvankar@yale.edu
- Dr. Hong Jin: Assistant Professor of Biochemistry at the University of Illinois Urbana Champaign. Phone: +1 (217) 244-9493 | Email: hjin@illinois.edu
- Dr. Samuel Flores: Dean of the Swedish National Graduate School in Medical Bioinformatics. Phone: +44 08 16 3949 | Email: samuel.flores@dbb.su.se