

Ling Jin

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Education

University of Southern California, Los Angeles, CA, United States

Ph.D. in *Molecular and Computational Biology*

Expected Spring 2026

University of Florida, Gainesville, FL, United States

B.Sc. in *Microbiology and Cell Science* & Minor in *Bioinformatics* with Cum Laude Honor

Graduated May 2020, Cum Laude

Research and Training Experience

Graduate Researcher

Xenopus Egg Extract Synthetic Systems

Department of Biological Sciences, University of Southern California (Supervisor: [Prof. Xianrui Cheng](#)) 2021-present

- Investigated cytoskeletal self-organization in *Xenopus* systems, discovering a novel class of acentrosomal asters that recruit cytokinesis signals (published in *Journal of Cell Science*, 2025)
- Engineered a scalable cell-free protein synthesis (CFPS) platform to optimize complex protein folding and cost-effective production for research and therapeutic use, with a manuscript in preparation for submission to *ACS Synthetic Biology*..
- Developed automated AI-assisted workflows for high-resolution imaging and data processing, transforming manual experiments into reproducible, high-throughput discovery pipelines.
- Standardized end-to-end data analysis frameworks that improved experimental consistency and enabled reliable, system-level scientific decision-making.

CRISPR-Cas9 Biophysics

Department of Chemistry, University of Southern California (Supervisor: [Prof. Peter Oin](#)) 2020-2021

- Investigated CRISPR-Cas9 conformational states and cleavage kinetics using fluorescence resonance energy transfer (FRET).
- Developed quantitative analysis pipelines to evaluate DNA binding and editing efficiency.

Developmental Biology Imaging

Department of Biological Sciences, University of Southern California (Supervisor: [Prof. Scott Fraser](#)) 2021

- Trained in high-resolution confocal and lightsheet microscopy for developmental imaging of *Xenopus* and zebrafish embryos.
- Assisted in visualizing morphogen gradients and tissue morphodynamics in live embryos to understand developmental patterning.

Scientific Contributor (2025–Present)

Consulting & Strategy Experience

Nucleate Activator Program, Los Angeles Chapter (Inventor: Paul-Marie Carfantan, Vitreum) 2025-present

- Evaluated R&D workflows and operational bottlenecks for early-stage biotech projects within the Nucleate Activator program
- Conducted market and competitive analysis for AI-enabled R&D tools to support product positioning and go-to-market strategy
- Collaborated with cross-functional teams to translate scientific requirements into scalable workflow and automation recommendations

Visiting Researcher

RNA Regulatory Network Detection

Department of Biology, Southern University of Science and Technology (Supervisor: [Prof. Wei Chen](#)) 2020

- Implemented RNA-seq-based computational pipelines for identifying RNA–protein regulatory interactions.
- Contributed to the development of crosslinking-based methods for RNA-binding protein mapping.

Chemical Biology and Genetic Code Expansion

Department of Pharmaceutical Chemistry, UCSF (Supervisor: [Prof. Lei Wang](#)) 2019

- Designed and applied genetically encoded light-controlled quinone methide crosslinkers for protein–protein and protein–RNA conjugation; published in *Nat. Chem.* (2023) and *Angew. Chem.* (2019).

Undergraduate Researcher

CRISPR-plus Technology Development

Department of Chemical Engineering, University of Florida (Supervisor: [Prof. Poyush K. Jain](#)) 2019-2020

- Engineered CRISPR/Cas12a platforms with enhanced nucleic acid detection sensitivity for infectious diseases.
- Co-developed a portable diagnostic workflow for HCV, HIV, and SARS-CoV-2 detection presented at AIChE 2020.

Molecular Evolution of Mutation Rates

Department of Biology, University of Florida (Supervisor: **Prof. Charles F. Baer**) 2018-2020

- Studied spontaneous mutation accumulation and its fitness consequences using *Caenorhabditis elegans* evolution lines.
- Quantified mutation spectra and rate heterogeneity using whole-genome sequencing.

Archaeal Protein Regulation and Metabolism

Department of Microbiology and Cell Science, University of Florida (Supervisor: **Prof. Julie Maupin-Furlow**) 2017-2020

- Investigated redox-sensitive regulator OxsR and its role in reactive oxygen species (ROS) homeostasis in Archaea.
- Characterized regulatory enzymes in thiamine (vitamin B1) biosynthesis pathways.
- Discovered ubiquitin-like interactions of nascent polypeptide-associated complex (NAC) proteins in archaeal systems, expanding understanding of proteostasis evolution.

Publications

Paper in Referred Journals

- Jin, L.**, Liu, M., and Cheng, X. (2025) Reconstituting protein synthesis in a near-native cytoplasmic environment using *Xenopus* egg extracts. (In preparation to submit to ACS synthetic biology)
- Jin, L.**, Liu, M., and Cheng, X. (2025). A centrosomal aster with atypical microtubule polarity recruits cytokinesis signals to its center in *Xenopus* egg extracts. *J. Cell Sci.* 138, jcs263766. <https://doi.org/10.1242/jcs.263766>
- Sun, W., Wang, N., Liu, H., Yu, B., **Jin, L.**, Ren, X., Shen, Y., and Wang, L. (2023) Genetically encoded chemical crosslinking of RNA in vivo. *Nat. Chem.* 15: 21-32
- Liu, J., Cai, L., Sun, W., Cheng, R., Wang, N., **Jin, L.**, Rozovsky, S., Seiple, I., & Wang, L. (2019). Photocaged Quinone Methide Cross-linkers for Light-controlled Chemical Cross-linking of Protein-protein and Protein-DNA Complexes. *Angewandte Chemie International Edition*.

Talk in Conference

- Jin, L.**, Liu, M., & Cheng, X. A Polarity-Reversed Microtubule Aster Mediates *De Novo* Assembly of Living Systems. *American Society for Cell Biology Cell Bio 2024*. San Diego, CA, 2024
- Nguyen, L., Smith, B., **Jin, L.**, & Jain, P. (2020). Engineered CRISPR/Cas12a System As a Sensitive Diagnostic Tool for Detecting HCV, HIV, and SARS-CoV-2. *2020 AIChE Annual Meeting*.

Poster Presentations

- Jin, L.**, Liu, M., & Cheng, X. A Polarity-Reversed Microtubule Aster Mediates *De Novo* Assembly of Living Systems. *American Society for Cell Biology Cell Bio 2024*. San Diego, CA, 2024
- Jin, L.**, Mondragon, P., Maupin, J.A., Thiamine diphosphate synthesis from thiamine in Archaea. Undergraduate Research Symposium, Gainesville, FL, 2019.
- Jin, L.**, Adams, Z., Batbatan, C., Maupin, J.A., Ubiquitin-binding of nascent polypeptide-associated complex (NAC) protein in Archaea. Florida Undergraduate Research Conference, Jacksonville, FL, 2019.

Teaching Experience

Teaching Assistant, Department of Biological Sciences, USC

- BISC120: General Biology: Organismal Biology and Evolution (2021, 2025)
- BISC 220 General Biology: Cell Biology and Physiology (2026)
- BISC110: Good Gene Bad Gene (2024, 2025)
- BISC403: Advanced Molecular Biology (2024)

Teaching Assistant, Department of Microbiology, University of Florida

- MCB2006: Microbes Without Borders (2018)

Mentoring

Supervised multiple undergraduate and high school researchers at USC, providing training in imaging, protein purification, and quantitative analysis.

Graduate mentees: Penny Pei, Betty Liu

Undergraduates: Amanda Taing, Christopher Ahn, Carolyn Guo, Natalie Toma, Helen Ku, Alan Zhu, Anson Liang, Evan Dittus

High school mentee: Emily Chang

Awards and Honors

- **Dornsife Summer Research Fellowship**, USC Dornsife College of Letters, Arts, and Sciences, \$5000 2025
- **Professional Development Fund**, USC Graduate Student Government, \$500 2025
- **American Society for Cell Biology Travel Grant**, \$500 2024
- **MBGSA Travel Grant**, USC Molecular Biology Graduate Student Association, \$750 2024
- **International Scholar Program Certification**, Univ. of Florida 2020
- **CALS Scholarship**, College of Agricultural and Life Science, Univ. of Florida (\$1,000 stipend) 2019 – 2020
- **Phi Kappa Phi Scholarship**, The Honor Society of Phi Kappa Phi Scholarship (\$1,500 stipend) 2019
- **Emelie Matthews Award of Excellence**, College of Agricultural and Life Science, UF (Finalist: top 3) 2019

Technical Skills

Wet Lab & Assay Development: Protein expression (E. coli, cell-free), assay development, molecular cloning, CRISPR, fluorescence microscopy

Automation & Data Pipelines: Automated image-analysis workflows, metadata extraction, API-driven pipeline integration, reproducible workflow design

Computational & AI: AI-assisted protein design (AlphaFold, RFdiffusion), basic ML for imaging/phenotyping, model-guided sequence and structure analysis

Programming & Data Science: Python (NumPy, Pandas, SciPy, scikit-learn, OpenCV), MATLAB, R, Bash, Git; statistical modeling and data visualization