

# Ling Jin

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## Summary

PhD candidate in Molecular and Computational Biology with strong training in complex R&D systems, quantitative data analysis, and workflow design. Experienced in translating scientific and technical complexity into clear, structured insights through automation, analytics, and cross-functional collaboration. Motivated by improving how research organizations make decisions, streamline operations, and adopt new technologies at scale.

## 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

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### Graduate Researcher

#### Xenopus Egg Extract Synthetic Systems

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

- Designed and implemented end-to-end imaging and data workflows, improving data consistency and interpretability across experiments and enabling more reliable downstream scientific decisions.
- Built AI-assisted pipelines for analyzing spatial protein localization and cytoskeletal dynamics in *Xenopus* systems.
- Designed cell-free transcription–translation systems for metabolic and proteomic studies, with a manuscript in preparation for submission to *ACS Synthetic Biology*.
- Discovered acentrosomal asters with reversed polarity recruiting cytokinesis signals; published in *Journal of Cell Science* (2025).

### CRISPR-Cas9 Biophysics

Department of Chemistry, University of Southern California (Supervisor: [Prof. Peter Qin](#)) 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**

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### **Paper in Referred Journals**

1. 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)
2. 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>
3. 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
4. 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**

5. 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
6. 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**

1. 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
2. Jin, L., Mondragon, P., Maupin, J.A., Thiamine diphosphate synthesis from thiamine in Archaea. Undergraduate Research Symposium, Gainesville, FL, 2019.
3. 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**

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### **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**

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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

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

## Technical Skills

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**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