

# 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.

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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

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## 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

- 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). Acentrosomal 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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- **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

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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