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
- 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

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

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.
Grudate 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