

Xinrui Wei

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Education

University of Colorado Anschutz Medical Campus

PhD student in Molecular Biology

GPA: N/A

Aurora, CO

Aug 2025 – Now

University of Maryland, College Park

Bachelor of Science in Psychology

Bachelor of Science in Biological Sciences, Specialization: Physiology and Neurobiology

GPA: 3.73/4.00

Dean's List for 6 semesters; Recipient of OMSE Academic Excellence Award (2020-2023)

College Park, MD

May 2023

Publications & Presentations

Keating, P. M., Schifano, N. P., Wei, X., Kong, M. Y., & Lee, J. (2024). "pH-dependent conformational change within the Lassa virus transmembrane domain elicits efficient membrane fusion." *Biochimica et biophysica acta. Biomembranes*, 1866(1), 184233.

Krishnaraj, A. *, Wei, X. *, Thakral, R. *, Guo, W., Subramaniyan, S. B., Zhang, X., Alley, K. R., Feng, A., Hoy, A., Kung, D., Tiwari, P. B., Üren, A., Maillard, R., DeRose, V. J., & Nair, S. J. (2025). "Transcriptome-wide mapping reveals an RNA-dependent mechanism of platinum cancer drugs." *Manuscript submitted for publication* *These authors contributed equally to this work.

Wei, X., Krishnaraj, A., Thakral, R., Guo, W., Hoy, A., Maillard, R., DeRose, V. J., & Nair, S. J. (2025). "Investigating the role of RNA structures in mediating the efficacy of platinum-based chemotherapeutic agents." *Poster presentation* at the 9th Chesapeake Bay Area Single Molecule Biology Meeting (CBASMB), Washington, DC, May 2025.

Research Experience

University of Colorado Anschutz Medical Campus

Graduate Research Assistant

Mentor: Dr. Matthew Taliaferro (Rotation Project #1)

"Identification of cis-localization element and transport protein that mediate mRNA targeting to the midbody."

- Examined the localization capacity of the proposed human *NET1* RNA cis-localization element using the bi-directional reporter system appended with different 3'UTR variants;
- Enriched MBsomes (secreted midbody remnants) from cell lines containing different reporter constructs and quantified localization ratio via TaqMan qPCR;
- Performed KIF1C knockdown in HeLa cells using RNAi and measured changes in intracellular bridge length in KIF1C KD cells through Immunofluorescence (IF);

Aurora, CO

Aug 2025 – Nov 2025

Georgetown University, Lombardi Comprehensive Cancer Center

Professional Research Assistant

Supervisor: Dr. Sreejith Nair

1). "Transcriptome-wide mapping reveals an RNA-dependent mechanism of platinum cancer drugs."

- Performed large-scale screening of RNA binding across the FDA-approved oncology drug library;
- Characterized how cisplatin (CisPt) binding modulates RNA secondary structure using CD spectroscopy, UV-Vis spectrophotometry, and fluorescence-based binding assays;
- Assessed polypharmacology effects on ovarian cancer cell lines using more than five drug combinations;
- Investigated protein partners recognizing CisPt-bound RNAs by designing rG4BP affinity pull-down

Washington, DC

Aug 2023 – Jul 2025

- assays with custom small-RNA baits, followed by mass spectrometry and Western blot validation;
 - Contributed to identifying key determinants of cisplatin sensitivity through a genome-wide CRISPR knockout screen;
 - Evaluated the stability and cellular toxicity of CisPt-bound RNAs using dot blot and western blot assays;
- 2). *“Examining the role of SON Protein in Nuclear Speckle in regulating 3D genome structure.”*
- Accomplished design and optimization of CRISPR/Cas9 knock-in degron system for controlled SON protein elimination via non-homologous end joining (NHEJ) pathway;
 - Enhanced transfection success rate and knock-in efficiency;
 - Contributed to the establishment of degron systems in different human cell lines and genotyping selected cells;
- 3). *Miscellaneous:*
- Lab safety manager; Leading inventory check and weekly ordering; New lab member onboarding;
 - Participated in the training of over five new lab members;

University of Maryland, College Park
Undergraduate Research Assistant

College Park, MD
 Aug 2022 – Jul 2023

Mentor: Dr. Jinwoo Lee

“pH-dependent conformational changes of Lassa Virus transmembrane domain and membrane fusion”

- Generated >10 transmembrane-domain mutation variants of the Lassa virus GP2 protein using site-directed mutagenesis;
- Optimized transmembrane protein expression by testing multiple bacterial cell growth strategies and purification protocol based on affinity chromatography;
- Performed CD spectroscopy and quantitative analyses on wild-type and all mutant proteins to characterize structural transitions between pre- and post-fusion states;
- Participated in proteoliposome/labeled-liposome preparation and lipid mixing assay;
- Prepared samples for Nuclear magnetic resonance (NMR) experiments;

Other Experience & Internship

Keck Graduate Institute
Lab Technician/Student

Claremont, CA
 Jun 2022 – Jul 2022

Bioprocessing Summer Undergraduate Internship Training and Education (BSUITE)

- Performed 80+ hours of mammalian cell culturing, *E. coli* fermentation, and bioseparation (affinity chromatography, UF/DF) experiments;
- Led the analysis of cell growth and metabolic data using major analytical techniques;
- Collaborated with team members for the project in simulating biopharmaceutical processing steps for insulin;

University of Maryland, College Park
Organic Chemistry Laboratory Teaching Assistant

College Park, MD
 Sept 2021 – Dec 2021

- Assisted course instructors with lecture preparation and curriculum implementation in small sections;
- Held office hours on the weekly basis and co-held review events before examinations;
- Participated in major grading events of two chemistry lectures;
- Ensured the safety of students by monitoring behaviors, tracking safety hazards, and managing visitors;

Leadership and Activities

Chinese Students and Scholars Association (UMDCSSA)
Projects/Events Committee Member

College Park, MD
 Sept 2018 – May 2019

- Structured proposals for four events/activities held in academic semesters;
- Led in budget estimation for events and activities;
- Participated in holding joint events across universities in the DMV region;

Skills

Experimental Skills:

- **Cell Biology & Cell-based Techniques:** Mammalian and bacterial cell culture, Transformation, Transfection, Electroporation, Lentivirus transduction, Flow cytometry (sorting/analyzing), Immunofluorescence (IF), single-molecule fluorescence in situ hybridization (smFISH), Cell viability assay, Drug synergy screening;
- **Molecular Biology & Nucleic Acid Techniques:** DNA/RNA extraction, PCR, RT-qPCR, TaqMan qPCR, Gibson assembly, Site-directed mutagenesis, CRISPR/Cas9 knock-in/knock-out, RNAi, Agarose gel electrophoresis, Nucleic acid dot blot;
- **Biophysical & Analytical Techniques:** Circular dichroism (CD) spectroscopy, UV-Vis spectroscopy, Surface plasmon resonance (SPR), Mass spectrometry, Lipid mixing assay;
- **Protein Biochemistry & Immunoassays:** Protein expression and purification, SDS-PAGE, Western blot, ELISA, Affinity pull-down assay;

Software and Tools:

- R/RStudio, Python;
- SnapGene, PyMol, ChimeraX, ImageJ/Fiji, FCS Express, JASP, Qualtrics; SynergyFinder+, BLAST/Database Search;
- GraphPad Prism, Microsoft Office 365, BioRender, Benchling;

Soft Skills: Collaboration, Communication, Creative problem-solving, Working independently;

Language: Mandarin (native), English (proficient)