

Sadikshya Rijal

sadikshyarij@gmail.com | linkedin/sadikshyarijal | scholar/sadikshyarijal

Education

Ph.D. in Biological Design, *Arizona State University (USA)*, GPA: 4.0/4.0 2022 – Expected July 2026
MS in Biological Design, *Arizona State University*, GPA: 4.0/4.0 2022 – 2025

Skills

Molecular Biology Techniques: PCR, qRT-PCR, cloning, bacterial mutagenesis, CRISPR interference (CRISPRi), DNA/RNA extraction, in vitro transcription, bacterial and mammalian cell culture, aseptic technique

Analytical and Cell-Based Techniques: ELISA, flow cytometry, fluorescence/confocal microscopy

Computational and Data Analysis Tools: Python, Matlab, MEGA X

Leadership: Co-Managing Director, Nucleate Arizona

Experience

Arizona State University | PI: Xiaojun Tian, Ph.D. 2022 – Present
Graduate Research Associate Tempe, AZ

- Integrated dCas9 into the *Escherichia coli* genome to implement CRISPRi across two gene modules, mitigating resource competition and improving synthetic gene circuit predictability [1]
- Investigating liquid-liquid phase separation (LLPS)-mediated resource regulation, assessing feasibility of protein-based condensates for cellular resource redistribution using RT-qPCR and fluorescence-based assays in *E. coli* and HEK293 cells
- Engineered transcription factor and biomolecular condensate constructs to enhance synthetic gene circuit stability, defining measurable success criteria and interpreting outcomes against pre-specified hypotheses [3]
- Developed and version-controlled SOPs for qPCR analysis, genomic DNA integration, and condensate-mediated regulation, enabling reproducibility and cross-team technology transfer
- Mentored 3 undergraduate researchers on plasmid cloning workflows and experimental troubleshooting

Shubham Biotech 2020 – 2021
Research Intern Kathmandu, Nepal

- Performed DNA extraction and phylogenetic analysis of 25 coffee varieties in collaboration with the Coffee Development Center (CDC, Nepal); identified samples as *Coffea arabica* with 4.3% evolutionary divergence
- Isolated and characterized *Saccharomyces sp.* indigenous to Kabilas, Nepal, using biochemical assays and ITS sequencing

Kathmandu University 2018 – 2020
Undergraduate Researcher Dhulikhel, Nepal

- Mapped evolutionary relationships of prokaryotic and eukaryotic Ku DNA-repair proteins using Python and MEGA-X, synthesizing sequence data from NCBI and OrthoDB into actionable insights on protein function and conservation [2]

Selected Publications

- Rijal, S.**, Standage-Beier, K., Zhang, R., Stone, A., Youssef, A., Wang, X., Tian, X.J. "CRISPRi-Linked Multi-Module Negative Feedback Loops to Address Winner-Take-All Resource Competition." *ACS Synthetic Biology* (2025). doi: 10.1101/2025.05.15.65435

Selected Publications (continued)

2. **Rijal, S.**, Mainali, M., Bhattarai, HK. "Evolutionary history of the DNA repair protein, Ku, in eukaryotes and prokaryotes." *PLOS ONE* (2025). doi: 10.1371/journal.pone.0308593
3. Zhang, R., Yang, W., Zhang, R., Godar A., **Rijal, S.**, Youssef, A., Nielsen, DR., Zheng, W., Tian, XJ. et al. "Phase Separation to Resolve Growth-Related Circuit Failures." *Cell* (2025). doi: 10.1101/2024.11.01.621586
4. Stone, A., **Rijal, S.**, Zhang, R., Tian, XJ. "Enhancing circuit stability under growth feedback with supplementary repressive regulation." *Nucleic Acids Research* (2024). doi: 10.1093/nar/gkad1233
5. Stone, A., et al., Youssef, A., **Rijal, S.**, Zhang, R., Tian, XJ. "Context-dependent redesign of robust synthetic gene circuits." *Trends in Biotechnology* (2024). doi: 10.1016/j.tibtech.2024.01.003

Conference Presentations

1. **Rijal, S.**, Standage-Beier, K., Zhang, R., Stone, A., Youssef, A., Wang, X., Tian, XJ. "CRISPRi-Linked Multi-Module Negative Feedback Loops to Address Winner-Take-All Resource Competition." **SEED Conference 2025**, (Poster Presentation), Houston, TX
2. **Rijal, S.**, Standage-Beier, K., Zhang, R., Stone, A., Youssef, A., Wang, X., Tian, XJ. "CRISPRi-Linked Multi-Module Negative Feedback Loops to Address Winner-Take-All Resource Competition." **EBRC Annual Meeting 2025**, (Oral Presentation), Seattle, WA

Leadership

- Co-Managing Director of Partnerships** 2026 – Present
Nucleate Arizona
- Co-Director of Partnerships** 2024 – 2026
Nucleate Arizona
- Led partnership initiatives with Arizona biotechnology and intellectual property companies
 - Launched 2 successful startup ideation challenges for life sciences students
 - Organized webinar series featuring biotech industry leaders