

Xin XIONG

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Education

Sichuan University, Life Science

Sept 2023 – Jun 2027

- GPA: 3.89/4.0 (transcript)
- **Coursework:** Genetics (96) Organic Chemistry(96)Calculus (94) College Chemistry (91) Plant Biology (91) Probability Statistic (90) Microbiology (91) Cellbiology (90) Plant Biology Experiment (98) Biochemistry (89)

Honor and Grants

- National Scholarship(Top 2%, 2024)
- Outstanding student of Sichuan University

Projects

Co-transduction of Phage Pathogenic Island (PICI) AND Intergrated and Conjugative Elements (ICE)

Sept 2024 – Now

- **Genomic analysis:** Conducted large-scale genome mining using Prokka, BLAST, and HMMER to scan hallmark genes; built phylogenetic trees (IQ-TREE, MEGA) of conserved integrases and replication proteins; annotated antibiotic resistance and virulence genes; identified putative cargo genes and potential co-transduction events.
- **Proteomic analysis:** Characterized conserved protein domains through Pfam and InterProScan, performed multiple sequence alignments (Clustal Omega, MUSCLE), and compared structural homology with reference proteins.
- **Machine learning:** Applied random forest classifiers (scikit-learn) to genomic datasets for predicting PICI-ICE co-transduction; integrated sequence features, codon usage, and domain architecture into the model.
- **Experimental validation:** Verified the PICI life cycle through PCR-based excision/circularization assays and phage induction; employed CRISPR-Cas9 genome editing for resistance marker tagging and functional studies.
- **Interdisciplinary integration:** Combined microbiology, bioinformatics, and AI-based modeling to explore the evolutionary impact of horizontal gene transfer and its role in antibiotic resistance dissemination.

IGEM:TasAnchor

June 2025 – Oct 2025

- **Genetic engineering:**Edited Bacillus subtilis genome by knocking out the endogenous TasA gene; constructed the pHT01 expression vector incorporating the SpyTag/SpyCatcher system to build a modular adhesion scaffold.
- **Plasmid construction and expression:** Designed and cloned constructs into E. coli BL21(DE3); induced protein expression using IPTG and performed purification via Ni-NTA affinity chromatography.
- **Functional material integration:** Engineered an adhesion module on polystyrene substrates, enabling the immobilization of B. subtilis biofilms on bioreactor filter membranes.

The Application of Urogenic Stem Cell Composite Hydrogel Material in the Repair and Treatment of Nasal Septum Perforation

June 2024 – Oct 2024

- To explore the mechanism of epithelial differentiation of stem cells and the reconstruction of structure and function after hydrogel, the three-dimensional composite material of human urine-derived stem cells and hydrogel was collected and used in the intervention experiment in mouse nasal septum

Experiences

Peking University summer training

Jul 2025

Westlake University International Undergraduate Summer School

Aug 2025

Technologies

Wet lab: PCR, Southern Blot, WB, Plasmid Assembly, Crispr, Protein Expression, Protein purification, Homologous recombination

Bioinformatics: Biopython, Prokka, RAST, BLAST,

Computational: Python, RStudio, VS Code, Machine learning, Deep learning, Linux(bash)

More Information Please visit: xiongxin.online