Zhicheng Jiang

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Education

High School Affiliated to Shanghai Jiao Tong University, Shanghai, China **Sep. 2020 – Jul. 2023**

Fudan University, Shanghai, China **Sep. 2023 – Jul. 2027 (expected)**

Bachelor of Science in Biological Sciences

- GPA: **3.95/4.0**, rank: **1/103**
- TOEFL: **112/120**

Presentations

- **Zhicheng Jiang** et al., *From Stress to the Gut: Dissecting the Neural Circuitry of Gastrointestinal Dysmotility*. **Poster presentation** at the 13th Symposium for Undergraduate Honors Program in Biology, Beijing, China, 2026. *(Best Poster Presenter Award)*
- **Zhicheng Jiang** et al., *From Stress to the Gut: Dissecting the Neural Circuitry of Gastrointestinal Dysmotility*. **Oral presentation** at the SFP Summer Seminar, Pasadena, CA, USA, 2026
- **Zhicheng Jiang** et al., *The Mammillary Body in Wernicke–Korsakoff Syndrome: Revisiting the Thiamine Deficiency Model.* **Oral presentation** at the 12th Symposium for Undergraduate Honors Program in Biology, Beijing, China, 2025. *(Best Oral Presenter Award)*
- **Zhicheng Jiang** et al., *Targeting AAVR Expression for Improved Recombinant AAV Gene Therapy: A Drug Screening Approach.* **Poster presentation** at the 12th Symposium for Undergraduate Honors Program in Biology, Beijing, China, 2025.

Research Experiences

California Institute of Technology, Pasadena, CA, USA **Mar. 2026 - Aug. 2026**

Visiting Undergraduate Research Program (VURP) Fellow

Advisor: **Yuki Oka**, Professor of Biology; Investigator, Heritage Medical Research Institute

Mentor: **Bochuan Teng**, Postdoctoral Scholar Research Associate in Biology and Biological Engineering

Project 1: Dissecting the neural circuitry of stress-induced gastrointestinal dysmotility (Independent Research)

- Characterized stress-induced gastrointestinal dysmotility in mice, showing that acute stress reduces upper-GI transit while increasing lower-GI output.
- Identified recruitment of the medial amygdala (MeA) and celiac–superior mesenteric ganglion complex (CG-SMG) during acute stress.
- Combined sympathetic denervation and chemogenetic manipulation to probe circuit function.
- Extended the acute-stress paradigm to repeated stress, revealing persistent alterations in baseline GI function after stress exposure ended.

Fudan University, Shanghai, China **Sep. 2024– Present**

Advisor: **Miao He**, Professor; Institutes of Brain Science

Project 2: Abrupt decompensation and selective brain vulnerability in thiamine-deficient mice (Independent Research)

- Resolved the temporal progression of pyrithiamine-induced thiamine deficiency (PTD) using behavioral and metabolic measurements, revealing a transition from preserved function to abrupt decompensation.
- Mapped brain-wide regional vulnerability in PTD, identifying the mammillary body as one of the earliest and most consistently affected regions.
- Integrated lesion patterns with cerebral glucose-utilization and vascular datasets, showing that vulnerable regions tend to have high baseline metabolic activity and dense vascularization, while these features alone do not fully explain selective vulnerability.

Project 3: Circuit Mapping of Penk$^+$ and Nts$^+$ Neurons in the Medial Mammillary Nucleus (Independent Research)

- Characterized the spatial distribution of Penk$^+$ and Nts$^+$ neurons in the mammillary body (MBO) and examined their co-expression with other neuronal subtypes.
- Used rabies-based monosynaptic tracing to identify distinct input sources and connectivity patterns from upstream brain regions.
- Applied AAV anterograde tracing to delineate projection topology and synaptic transmission pathways across the brain.

Fudan University, Shanghai, China **Sep. 2024 - Feb. 2025**

Advisor: **Chen Ling**, Professor; School of Life Sciences

Project 4 : Targeting AAVR Expression for Improved Recombinant AAV Gene Therapy: A Drug Screening Approach

- Screened 2,138 AAVR-linked compounds using the L1000 transcriptomic database to identify small molecules enhancing rAAV transduction.
- Found Entinostat (ENT) significantly increased AAV2/AAV8 transduction in Huh7 and HEK293 cells, while Lapatinib showed no effect.
- Discovered ENT upregulated AAVR and GPR108 expression in Huh7 cells and enhanced AAVrh32.33 transduction via AAVR-independent pathways in HEK293 cells.

Skills & Techniques

- **Mouse/Neuroscience Experiments**
  - Mouse breeding, anesthesia, euthanasia, perfusion fixation, and brain/ganglion/gut tissue collection.
  - Stereotaxic injection of viruses, tracers, or pharmacological agents with precise regional targeting.
  - Fiber photometry for calcium signal recording and neural activity analysis in vivo.
  - Chemogenetic manipulation with DREADDs.
  - Cryosectioning, immunohistochemistry (IHC), tissue clearing with ScaleS, immunofluorescence staining.
  - Confocal microscopy, fluorescence microscopy, and image analysis.
  - Intraperitoneal/subcutaneous injection or oral gavage for drug administration, urine/blood sample collection for biochemical analysis.
  - Behavioral assays: open field test, fear conditioning, Y maze, rotarod, catwalk, elevated plus maze and novel object/location recognition test.
  - Physiological function assays: charcoal meal transit, whole-gut transit time, colonic bead expulsion.
- **Molecular Biology**

    - DNA/RNA extraction, purification, quantification, PCR, qPCR, RT-qPCR, and gel electrophoresis.
    - Cloning, plasmid construction, and bacterial transformation.
    - Western Blot, co-immunoprecipitation (co-IP), and ELISA.
- **Cell Biology**
    - Cell culture (primary and immortalized cell lines), aseptic techniques, and drug treatments.
    - Transfection and transduction using lipofection and viral vectors.
    - Immunofluorescence and immunocytochemistry staining for cellular markers.
    - Cell counting and viability assessment using hemocytometer and trypan blue exclusion.
- **Microbiology**
    - Bacterial culture, streaking, colony isolation, Gram staining and microscopy.
    - Phage infection, transduction experiments, antibiotic susceptibility testing and MIC determination.
- **Chemistry (Organic and Analytical)**
    - Organic synthesis, reflux, and distillation techniques.
    - TLC and column chromatography for compound purification.
    - Quantitative titration, solution preparation, spectrophotometry, conductivity, and pH measurement.
- **Drosophila Experiments**
    - Maintenance of fly stocks, genetic crosses, dissection and immunostaining of larval and adult tissues.
    - Behavioral and lifespan assays.
- **Data Analysis and Visualization**
    - Python: data cleaning and processing, statistical analysis, and neuronal signal analysis.
    - GraphPad Prism, ImageJ, SPSS, Bash, R, LabChart, and Origin for visualization and quantitative analysis.

Awards & Scholarships

- **First Prize**, National High School Biology League 2022
- **Third Prize**, 31st Chinese National Biology Olympiad 2022
- **Outstanding Student of Fudan University** (3 winners in 107 candidates) 2023
- **Second-Class Scholarship for Academic Excellence** 2024
- **Tan's School of Genetics Scholarship** (equivalent of Dean's List) 2024
- **Outstanding Project**, "Path to a Strong Nation" Course (Project4) 2025
- **Shenze Life Science Scholarship**, School of Life Sciences, Fudan University (4 winners in 107 candidates) 2025
- **Third Prize**, "Guanghua Cup" Social Practice Competition, Fudan University 2025
- **Certificate of Excellence**, Life Sciences Frontier Leadership Seminar, Nanyang Technology University 2025
- **Member**, Fudan University Life Sciences Pioneer Program (11 winners in 213 candidates) 2025

Activities

- Delivered a lecture about Model Animals and Neuroscience to high school students during the **"Life Voyage" Social Practice Program**; received feedback as **"the best lecture I've ever heard."** Also led a guided literature-reading session. The recorded videos were uploaded to Bilibili, gaining **over 20,000 views**. 2024, 2025
- Participated in an **ecological field study in Tibet**, responsible for video recording and writing posts for the official

WeChat account. Aug. 2024

- Conducted **guest reception and photography** in multiple **fireside events** featuring distinguished professors and alumni, including U.S. National Academy of Sciences members Jerry Workman and Don Cleveland. 2024, 2025
- Attended the **Summer School** of the CAS Center for Excellence in Brain Science and Intelligence Technology (CEBSIT). Jul. 2025
- Participated in **academic study visits** to Nanyang Technology University (NTU) and The University of Hong Kong (HKU), engaging in seminars and discussions with local faculty members. Aug. 2025