Jianfan Yang

Tel: +86 15603396255 | E-mail: yangjf20@mails.tsinghua.edu.cn

EDUCATION

Tsinghua University **Beijing, China**

B.S. in Biological Science **Sept. 2020 - Jun. 2024**

- GPA: 3.77/4.00;
- Core Courses: Fundamental Neuroscience (A+); General Biology (A); Basic Practical Biochemistry (A); Experiment of Cell Biology (A); Scientific Research Training (A); Molecular Biology (A-); Biochemistry (A-); Physiology (A-)

RESEARCH EXPERIENCE

Finding the Neural Basis of Memory Integration in Rodents* **Toronto, Canada**

Research Assistant, JF Lab at the Hospital for Sick Children (PI: Prof. Sheena Josselyn) **May. 2023 - Present**

- Applied Python DABEST package for data analysis on the duration of time mice spent in different zones of an open arena, refining the analytical process and optimizing output results.
- Utilized Matlab polarscatter function, along with Python Matplotlib and Seaborn libraries, for precise data visualization. Generated figures for research publication.

*In preparation, will be submitted to *Cell*

Characterization of Positive and Negative Engrams with MAPseq in the Lateral Amygdala **Toronto, Canada**

Research Assistant, JF Lab at the Hospital for Sick Children **Jul. 2023 - Present**

- Acquired a thorough understanding of the principles and applications of MAPseq, equipping myself with the knowledge to utilize this technique in relevant research contexts.
- Conducted molecular experimental design and implementation to integrate optogenetics into MAPseq, including selecting a cloning scheme, exploring the experimental system, preparing necessary materials and reagents, performing molecular cloning.

Memory Retrieval Induces Cross-modal Updating of Multi-modal Memory and Its Underlying Mechanisms* **Beijing, China**

Research Assistant, Yi Lab at Tsinghua University (PI: Prof. Yi Zhong) **May. 2023 - Present**

- Independently designed and executed a comprehensive research plan, exploring the cross-modal effects of memory retrieval in multi-modal memory systems.
- Formulated the research question of whether memory retrieval induces cross-modal effects, and selected context and sound as the two modalities of interest for memory investigation.
- Developed a behavioral paradigm for mice, aiming to verify whether memory retrieval within a modality leads to memory updating and whether retrieving one modality's memory enhances memory specificity of another modality.
- Successfully validated the behavioral paradigm for sound memory retrieval and demonstrated that retrieving sound modality memory triggers memory updating within the sound modality.
- Ongoing research involves further experiments and investigations to explore the cross-modal effects of memory retrieval and its underlying circuit mechanisms.

*Rated as an 'A-level' project under the Academic Research Advancement Program of Tsinghua University
*Nominated for the Youth Student Basic Research Program of National Science Foundation in September 2023

The Function of NRAM$^+$ ensembles in dDG in memory updating **Beijing, China**

Research Assistant, Yi Lab at Tsinghua University **Mar. 2022 - May. 2023**

- Proficiently utilized the NRAM labeling system to mark and manipulate Npas4-dependent neuronal subpopulations, ensuring accurate targeting of specific neurons for memory updating analysis.
- Actively participated in a series of experiments using the contextual fear conditioning (CFC) paradigm in mice, primarily focusing on learning and understanding the research process. Assisted senior researchers in key tasks, such as ensuring the proper maintenance and preparation of the fear conditioning chamber between trials.
- Employed optogenetics to inhibit or activate NRAM$^+$ ensembles in mice and subsequently analyzed freezing behavior to validate the necessity and sufficiency of NRAM$^+$ ensembles in memory updating processes.

Upregulation of Raf/MAPK Pathway Underlies Pathophysiology of Mania **Beijing, China**

Research Assistant, Yi Lab at Tsinghua University **Oct. 2021 - Sept. 2022**

- Engaged in an in-depth study of the Raf/MAPK signaling pathway and its impact on depression and mania, acquiring a comprehensive understanding of its underlying mechanisms.
- Mastered a series of classic neuroscientific techniques, including: precise stereotaxic surgeries, perfusion, vibratome sectionin, and confocal imaging.
- Participated in the research pipeline actively, streamlining processes to guarantee the precision and efficiency of experimental procedures.

- Collaborated closely with senior researchers, analyzing and discussing data findings to draw meaningful conclusions and insights.

Diagnosis and Treatment of Inflammatory Bowel Disease (IBD) through Genetic Engineering* **Beijing, China**

Team Member, International Genetically Engineered Machine (IGEM) Competition (Supervisor: Prof. Guoqiang Chen) **Jan. 2021 - Oct. 2021**

- Cloned Trefoil Factor 3 (TFF3) gene and executed plasmid introduction during preliminary experiments, providing fundamental evidence for the potential therapeutic use of genetic engineering in IBD treatment.
- Spearheaded the "Mucosal Healing" project, conducted literature reviews to select the appropriate secretion peptides gene, cloned and linked it to TFF3 via a Ser/Gly linker.
- Introduced the NO sensor as an molecular switch to control the expression of TFF3 gene.
- Validated the expression of the engineered TFF3 with Western Blotting.
- Collaborated in editing the introductory video of project, contributed to the iGEM wiki uploads, highlighting the innovative approach for IBD treatment.

*Awarded Gold Medal in the 1st Synthetic Biology Competition SYNBIO HIVE

EXTRACURRICULAR EXPERIENCE

Class 01 of School of Life Sciences & Grade 20 of "Tsinghua Xuetang Life Science Program" **Beijing, China**

Class Leader **Sept. 2020 - Present**

- Effectively coordinated the work of the Steering Committee, leading to the successful organization of more than 20 academic activities, including academic seminars, journal clubs, research luncheons, and guest lectures.
- Skillfully facilitated communication between students and faculty, resulting in high student satisfaction.

Shenzhen Experimental High School & XueDaWeiYe Biology Olympiad Training Institution **Beijing, China**

Biology Competition Teacher (Part-time) **Jul. 2021 - Present**

- Actively developed curriculum for high school students participating in National Biology Olympiad and AP Biology.
- Systematically organized mock competitions and practice sessions, analyzing results to guide improvements and boost performance on challenging competition topics.

Tsinghua University Musical Club **Beijing, China**

President **Mar. 2022 - Present**

- Successfully organized the student version musicals "Rebecca" and "Mozart", attracting over 2000 attendees.
- Effectively negotiated and executed an affirmative contract with Blank ME, a renowned Chinese company, securing an amount of $2,500 sponsorship from the company.
- Strategically planned and implemented promotional campaigns, including roadshows and social media marketing, resulting in a record-breaking 300 new members joining the musical club.

AWARDS

1. Membership & Grade Representative in “Tsinghua Xuetang Life Sciences Talents” **2021 - 2023**
2. Gold Award & Best Part Prize in the 1st Synthetic Biology Competition “SYNBIO HIVE” **2022**
3. Second Prize in the 17th "Novozymes Cup" Capital Life Science Culture Festival (Ratio: 4/73) **2022**
4. Third Prize in the 40th Tsinghua "Challenge Cup" for miRNA *in vitro* Testing Tool **2022**
5. Tsinghua Overall Excellence Scholarship, equivalent to Dean's List **2021 - 2022**
6. Best Presentation Prize in the 8th International Genetically Engineered Machine Competition Chinese Conference **2021**
7. Freshmen Scholarship (Top 10%) **2020**
8. Gold Award & National Training Team in National High School Biology Olympiad (Rank: 16) **2019**

SKILLS

Language
- English (Fluent); Chinese (Mandarin, native speaker); Italian, German, Japanese (Beginner)

Computer
- Python, Matlab, R, C, Latex, HTML, CSS, Snapgene, Graphpad Prism, Adobe Illustrator, Adobe Photoshop, Microsoft Office (Excel, Word, PowerPoint)

Laboratory
- **Neurobiology techniques:** Stereotaxic surgery, perfusion, vibratome sectioning, confocal imaging, mice behavior paradigms (CFC, AFC, etc.)
- **Molecular techniques:** PCR/RT-PCR, DNA/RNA purification, RNAi, Gibson assembly, chemical induction of competent cells, transformation, plasmid extraction, electrophoresis, gel extraction.
- **Biochemistry techniques:** ELISA, SDS-PAGE, Western Blotting, immunoprecipitation, Co-immunoprecipitation, chromatography.
- **Cell biology techniques:** H-E staining, primary cell culture and secondary cell culture, protoplast fusion, apoptosis detection, transfection.