



Jiayi Guo 郭佳亿

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Sex: Male | Date of birth: 17/02/2002 | Nationality: Chinese

RESEARCH EXPERIENCE

1. Research on Macrophage Death Induced by Cytoplasm Membrane Vesicles(CMV) Separated from Streptococcus Agalactiae Cells (Finished) 2022/07--2023/04

China University Life Science Competition (ULSC)

Role: Project leader

Abstract: This research focus mechanism of host cell inflammation and cell death caused by the interaction of cytoplasm membrane vesicles(CMV) released by streptococcus agalactiae(GBS) with mouse macrophages.

Contribution: Design the experiment, Identification of the Streptococcus Agalactiae and its CMVs, Hochst stain to visualize to death of Macrophage, ELISA to quantify to cytosine, Write the final thesis.

Learned skills: Basic molecular techniques, Scientific writing, Culturing cell, Data analysis and visualization with Excel

2. Recombinant Tumor Vaccine for Breast Cancer HER2 Antigen Based on Outer Membrane Vesicle (Finished) 2021/08--2023.05

National Innovation and Entrepreneurship Competition Fund

Role: Project leader

Abstract: This project uses ClyA protein as a guiding sequence to locate HER2 antigen to the outer membrane vesicles(OMV) of E. coli and elicit immune response in mouse macrophages.

Contribution: Writing the proposal, Construct recombinant plasmid and transfer it into recipient E.coli and identification, Identification of OMVs, Visualizing OMVs with confocal microscopy, Thesis defense, Writing and publishing review article

Learned skills: Literature searching and reading, Review writing, The construction of genetic recombinant bacteria, Culturing E.coli, Defense

3. Benchmarking Algorithms for Batch Correction in Single-cell ATAC-seq data Analysis (Finished) 2023/12--2024/04

Bachelor Thesis

Abstract: This project aims to assess the efficacy, accuracy, and scalability of different integration algorithms, providing insights into the performance of these software tools under varying conditions.

Contribution: Design the protocol, Data download and quality control, Data standardization, Annotating cell types, Processing the data with different algorithms, Calculating metrics and visualizing the result, Thesis defense(In English and Chinese)

Learned skills: The whole analysis steps of sc-ATAC data, Programming with Python, Defense in English, Operation on Linux, Operation on HPC

4. Investigating the Role of RNA and its metabolism in Centrioles Formation (Ongoing)

2025.02-Present(will be done before 2026.02)

Master Thesis

Abstract: This project aims to investigate the functions and systematically identify the existence of RNA at centrioles, make use of fluroscent microscopy and RNA-seq techology, which will provide more insights in centriole formation.

Contribution: Establish protocols of using qPCR to detect RNA in Centrioles; Co-localizing Centrioles and RNAs using RNA specific dyes and FISH; Perfrom data mining and data analysis on the RNA-seq data;

Learned skills: Experiment design; Literature Reading & Scientific Thinking; Sequencing data analysis; Analysis Pipeline making; Microscopy; Molecular Biology; Image process with FIJI ; Presentation

EDUCATION BACKGROUND

1.Bio-Engineering 2020/09--2024/07 *Bachalor of Engineering*

Inner Mongolia University(IMU) (Project 211, National key University)

Address: No. 24, Zhaojun Road; Yuquan District, Hohhot City, Inner Mongolia 010000

Major Courses(Bold font represents a score exceeding 85): **Bioinformatics, Probability Theory and Mathematical Statistics, Professional Foreign Language (English)**, General Biology, **Instrumental Analysis, Cell Biology**, Physiology, **Microbiology, Biological Statistics**, Biochemistry, College Chemistry, **Cell Engineering**, Advanced Mathematics, **Genetic engineering**, Molecular biology, **Principle of chemical engineering**

Served as Class Rep.

2.Bioinformatics 2023/12--2024/04 *Visiting Student*

Westlake University (Visiting student)

No.18 Shilongshan Road, Xihu District, Hangzhou, Zhejiang, 310024

Zhang Kai Lab (Lab website)

Major job: Finishing the content of the **Bachelor Thesis** and help the RA to do **some data analysis job**. Also supplement laboratory teaching documents.

Learned Skills: Basic concepts and methods of **Computational biology**, become proficient in **data science**. Ability of **making English presentation**.

3.Chemical Biology 2024/09--Present *Master of Science*

University of Geneva and École polytechnique fédérale de Lausanne(EPFL)

Geneva and Lausanne, Switzerland

Major Courses: Elements in bioinformatics, Machine Learning(Auditor), Microscopy and imaging course, Current trends in Chemical biology and Drug Development; Current Topics in Chemical Biology

PERSONAL SKILLS

Self assessment	Data processing	Data Mining	English Writing	Literature reading	Problem solving
	Competent	Competent	Proficient	Proficient	Competent

- ❖ Familiar with Systems such as Windows, MacOS, **Ubuntu or CentOS**, as well as some tools like “DepMap”, “UCSC genome browser” or GEO database, can manage my code with Github
- ❖ **Proficient in Python** and familiar with packages like pandas, scanpy, numpy as well as a beginner of C++
- ❖ Proficient in molecular lab skills like Westbloting, ELISA, SDS-PAGE, Genome extraction, PCR etc.

HONORS & PUBLICATIONS

Honors 09/2024, Merit Fellowship from SNE Chemical biology, Switzerland
09/2023, Selected as the candidate of "JingYing Scholar" Training Program of Inner Mongolia University
07/2023, Outstanding camper of Life science summer camp, University of Science and Technology of China
04/2023, Third-Class Model Scholarship of Inner Mongolia University
04/2023, Undergraduate First-class Academic Scholarship of Inner Mongolia University
05/2022, 2021 Outstanding Youth League Cadre of Inner Mongolia University
05/2022, University-level Merit Student of Inner Mongolia University
04/2022, Undergraduate Second-class Academic Scholarship of Inner Mongolia University
05/2021, 2020 Outstanding League Member of Inner Mongolia University
04/2021, Undergraduate Third-class Academic Scholarship of Inner Mongolia University

Publications [1]Sun Cai, Wu Yanhao, **Guo Jiayi**. Research Progress in the Application of OMV in Tumor Vaccines[J]. *Chinese Bulletin of Life Sciences*, 2022,34(11):1431-1441.DOI:10.13376/j.cbls/2022157,
[2]Wang S, **Guo J**, Bai Y, et al. Bacterial outer membrane vesicles as a candidate tumor vaccine platform. *Front Immunol*. 2022;13:987419. doi:10.3389/fimmu.2022.987419