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

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## RESEARCH EXPERIENCE

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### 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, Hoechst 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

## EDUCATION AND TRAINING

### 1. Biological Chemical Engineering 2020/09--2024/06

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

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

Major Courses: 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

GPA: 3.54 (WES);

Served as Class Leader

### 2. Bioinformatics 2023/12--2024/04

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 **graduation project** 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

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

## PERSONAL SKILLS

Self assessment	Data processing	Data Mining	English Writing	Literature reading	Problem solving
	Competent	Basic	Familiar	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
- ❖ Understanding the basic syntax of **Python** and familiar with some packages of python as well as a beginner of C++
- ❖ Proficient in molecular lab skills like Westblotting, ELISA, SDS-PAGE, Genome extraction, PCR etc.

## HONORS & PUBLICATIONS

- Honors
- 09/2024, Merit-based Fellowship from SNE Chemical biology
  - 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.cbbs/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