

Mengzhuo ZHENG

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Address: No.699, Binhu Road, Xiashan District, Weifang 261000, Shandong, China

Education

Huazhong Agricultural University(HZAU), Wuhan, China

Master of Science in Bioinformatics

09/2021-06/2024

GPA: 88.03/100

Core Courses: Applied Bioinformatic Technology, Computational Biology, Biostatistics, Medical Healthy Data Analysis and Mining, etc.

Thesis: Process Evaluation and Standardization of High-throughput Metagenome Sequencing of Soil Samples

Minor in Data Science

03/2023-04/2024

Core Courses: Time-Series Analysis, Bayesian Statistics with R, Nonparametric Statistics, Python Practice, etc.

Huazhong Agricultural University(HZAU), Wuhan, China

Bachelor of Science in Bioinformatics

03/2019-07/2021

GPA: 83.55/100

Core Courses: Mathematical Foundations of Bioinformatics, Principles of Bioinformatics, Data Structures and Algorithms B, Advances in Bioinformatics, Comprehensive Practice of Bioinformatics Software, etc.

Thesis: Fragment-based Inhibitor Designing for GSR Target

Bachelor of Agriculture in Horticulture

09/2017-06/2021

GPA: 3.65/4.00

Core Courses: Breeding Sciences of Horticultural Plant (fruits), Horticultural Plant Cultivation(Fruit), Bioinformatics, Plant Physiology, Basic Microbiology, Experimental Design and Data Analysis, etc.

Thesis: Exploration and molecular identification of doubled diploid plants from *Citrus. junos* and *C. aurantium L.*

Research Interest

Bioinformatics; Data Analysis; Machine Learning; Metagenome; Multi-omics Analysis; T2T Genome Assembly; Pan-genome;

Publication

Wang, T., Shi, Y., **Zheng, M.**, & Zheng, J. (2024). Comparative Genomics Unveils Functional Diversity, Pangenome Openness, and Underlying Biological Drivers among *Bacillus subtilis* Group. *Microorganisms*, 12(5), 986.

Available at <https://doi.org/10.3390/microorganisms12050986>

Li, Z., **Zheng, M.**, Zheng, J., & Gänzle, M. G. (2023). *Bacillus* species in food fermentations: an underappreciated group of organisms for safe use in food fermentations. *Current Opinion in Food Science*, 50, 101007.

Available at <https://www.sciencedirect.com/science/article/pii/S2214799323000218>

Zhu, Z., Dai, D., **Zheng, M.** et al. (2024). Root-knot nematodes exploit the catalase-like effector to manipulate plant ROS levels by directly degrading H₂O₂. *Molecular Plant Pathology*. 25(9), e70000.

Available at <https://bsppjournals.onlinelibrary.wiley.com/doi/10.1111/mpp.70000>

Research Experience

Process Evaluation and Standardization of Metagenomic Next-generation Sequencing of Soil Samples 10/2022-04/2024

Advisor: Jinshui ZHENG

- Collection and analysis of 3,304 global soil metagenomic sequencing samples to elucidate the compositional and functional differences across various soil environments; provision of informed suggestions on the minimum sequencing depth required for Metagenome-Assembled Genomes (MAGs) reconstruction
- Simulation of soil samples with different sequencing bases by ultra-deep metagenomic next-generation sequencing and subsampling techniques to identify the sequencing bases necessary for low-abundance MAGs and characterize the abundance, phylogenetic, and functional traits of MAGs under different sequencing depths
- Optimization of the MAG reconstruction pipeline based on the Oxford Nanopore Technologies (ONT) sequencing platform; determination of the minimum Next-Generation Sequencing (NGS) bases required for error correction in third-generation metagenomic data
- Comparison of the MAGs derived from ONT and NGS; revealing of the unique role of ONT in the process of archaeal ammonia oxidation

Structure and Function of Tomato Rhizosphere Microbial Community under Nematode Infestation 10/2022-Present

*Supported by Natural Science Foundation of China (NSFC)

Advisors: Ming SUN, Donghai PENG, Jinshui ZHENG

- Collection of rhizospheric metagenome, 16s amplicon, and tomato root transcriptome data under nematode infested and non-infested conditions
- Recognition of key microorganisms responding to changes in rhizosphere microbial communities and analysis of their impact on gene expression of host plants

Integrating Transcriptomic and Single-cell Data to Reveal Prognostic Microbial Features of Clear Cell Renal Cell Carcinoma and its Relation with Tumor Metabolic Pathways 01/2024-06/2024

- Identification of prognostic microorganisms in clear cell renal cell carcinoma
- Microbial prognostic score modeling based on 101 machine learning algorithms
- Identification of gene modules associated with prognostic microbial abundance using WGCNA and exploration of the effect of microbial abundance on metabolic activity and signaling pathways of different gene module networks

- Identification of tumor cell subpopulations associated with prognostic microorganisms and investigation on the effect of microbial abundance on metabolic processes in host cell subpopulations
- Mantel testing of the immune infiltration level related to prognostic microorganisms and studies on the effect of prognostic microorganisms on tumor immune infiltrating cells

Internship and Working Experience

Institute of Advanced Agricultural Sciences, Peking University 07/2024-Present
Weifang, Shandong

Bioinformatics Research Assistant

- Raspberry T2T genome assembly
- Construction of the raspberry pan-genome

Pfizer Inc. 12/2022-02/2023
Wuhan, Hubei

Biostatistics Intern

- Collection and analysis of clinical data
- Construction of prognostic models and blood-drug concentration models
- Writing of reports

Zhengzhou Fruit Research Institute, Chinese Academy of Agricultural Sciences(CAAS) 05/2020-06/2020
Zhengzhou, Henan

Intern

- Investigation on phenological period of fruit trees
- Investigation on biological habits in the National Horticultural Germplasm Resource Bank
- Determination of sugar-acid ratio

Award and Honor

Scholarships

The Second-Class Scholarship for Graduate Students of HZAU	Academic year 2023-2024
The Second-Class Scholarship for Graduate Students of HZAU	Academic year 2022-2023
The First-Class Scholarship for Graduate Students of HZAU	Academic year 2021-2022
The Second-Class Scholarship, Wuhan Yafei Seed Co, Ltd.	2019-2020

Awards in Discipline Competitions

The Third Prize, the 12 th Chinese Mathematics Competitions(CMC)	2020
The Third Prize, the 9 th Hubei Mathematics Competitions for College Students	2020
The Third Prize, the 3 th "China Education Cup" Mathematics Competitions(final)	2020
The First Prize, "China Education Cup" Mathematics Competitions	2020
The First Prize, Chemistry Experimental Skills Competition, HZAU	2019

Honors

Outstanding Graduates, HZAU	06/2021
Merit Students, HZAU	2019, 2020 & 2021

Skill and Qualification

Certificate

BGI Certified Bioinformatics Analyst

09/2022

Language

Mandarin (native); English (IELTS: 6.5)

My Personal Website

For more information: <https://mengzhuo-zheng.github.io/>