Ziwei (Zoe) Wu

Personal Homepage
State Key Laboratory of Biocontrol, Southern Marine Science and Engineering Guangdong Laboratory (Zhuhai), School of Ecology, Sun Yat-sen University, Guangzhou, China
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Education

Sun Yat-sen University
Master in Science degree — Aug. 2021 - Present
Majors: **Ecology** (honors program: Evolutionary Ecology)
Cumulative GPA: 3.5 (85.65/100)
Anticipated Core Courses: *Evolutionary Ecology*, Seminar in Ecology and Evolution, Data Analysis in R

Fujian Agriculture and Forestry University
Bachelor of Agriculture degree, summa cum laude — Sep. 2017 - Jun. 2021
Majors: **Plant Science** and **Technology** (honors program, quantitative focus)
Cumulative GPA: 3.5 (85/100)
Relevant Courses: Organic Chemistry B, *Microbiology*, Plant Physiology A, Biochemistry B, Probability Theory, *Biological Data*, Experimental Designs and Statistical Analyses, *Genetics (Bilingual Course)*, *Molecular Genetics*, Plant Cell Biology, Agroecology, *Biological Data Analysis*, Plant Biotechnology
Honors: **Gold** and Bronze **Awards at the International Genetically Engineered Machine (iGEM)** in 2021 and 2019, respectively, **Nominated for Best Sustainability (7/320 international student team) at iGEM in 2021**, Second Prize Scholarship (8% students), Advanced Individual in Social Work, and Excellent Volunteer in Cangshan District

Research Experience

1. **Crabs and Symbiotic Microorganisms: Collaborative Cellulose Degradation Facilitating Radiative Diversity in *Sesarmidae* — Genomic and Gut Microbiome Macro-genomic Analysis of Crabs** — Hongkong, China
   Co-first author, In Analysis — Nov. 2022 - Present
   - Led three *Sesarmidae* genome assemblies using third-generation ONT sequencing data.
   - Conducted **gene functional annotation (especially the annotation of CAZymes)** using transcriptomic data and homologous protein information, utilizing the Maker tool and public database.
   - Performed **three crabs' genomic collinearity analysis**, **CAZymes family assessment**, and **positive selection analysis** to identify distinctive gene families, significant expansions, and contractions in *Sesarmidae.*
   - Combining metagenomics and metatranscriptomics to reveal the molecular mechanism and evolutionary process of crab degradation of lignocellulose.

2. **Terrestrial Adaptation Evolution in Land Crabs: Exploring at the Genomic Level** — Shenzhen, China
   First author, Upcoming **Graduation Thesis** — Sep. 2022 - Present
   - Completed **genome assembly** using third-generation ONT sequencing data and Hi-C data.
   - Individually extracted RNA from five tissues of the Land Crabs (*Gecarcoidea lalandii)*, **constructed RNA libraries,** and **performed independent** third-generation **full-length cDNA ONT sequencing.**
   - Conducted **gene functional annotation** amalgamating second and third-generation transcriptomic data and homologous protein information.
   - Performed inner **genomic collinearity analysis**, **unique and shared gene family assessment**, and **positive selection analysis** to identify distinctive gene families, significant expansions, and contractions in *Gecarcoidea lalandii.*
     Additionally, scrutinized for genes under positive selection in *Gecarcoidea lalandii*, with the objective of elucidating the driving factors behind its adaptive evolution (terrestrial adaptation).

3. **Uncovering Influenza-Like Virus Clades and New Genera in Invertebrates: Evolutionary Insights into Orthomyxoviridae across Metazoans** Hongkong, China
   Co-first author, submitted in *Current Biology* (Cell Press) Jun. 2022 - Jul. 2023
   - Constructed **phylogenetic relationship** of newly identified viruses with known viral members from Orthomyxoviridae.
   - **Ancestral states** of the novel viruses and host associations analysis.

4. **Transcriptome Analysis of Pathogen-Induced Physiological Responses in Shrimp** Shenzhen, China
   First author, Published Feb. 2022 - Jan. 2023
   - Gathered nine RNA-Seq project datasets from the NCBI SRA and finally obtained 109 transcriptome expression profiles.
   - Generated **innovative ideas** to enhance project outcomes.
   - Proficiently acquired expertise in **Shell scripting** and effectively utilized **R programming languages**, which enabled me to complete the Data Processing, Plot Generation, and Initial Draft Writing independently.

5. **Microscopic Algae, "Macroscopic" Energy** Fuzhou, China
   Student Leaders & Advisors, iGEM Project Jun. 2018 - Nov. 2021
   - Led the construction of transgenic algal strains to enhance carbon dioxide fixation and lipid synthesis metabolism by overexpressing critical genes in the ascorbic acid metabolic pathway.
   - Led mathematical modeling experiments, **including**
     - **Designing** a Logistic growth model for microalgae based on growth trends.
     - **Developed** optimization models using cost and time data to predict optimal cultivation conditions and evaluate microalgae factory cost-effectiveness and profitability.

Academic Activities and Publication

- [1] **Wu ZW**, Chu KH*, Ma KY*. Transcriptome Analysis of Multiple Tissues in the Shrimp *Penaeus vannamei* Reveals the Typical Physiological Response to Three Pathogens[J]. Journal of Marine Science and Engineering. 2023; 11(2):389.
- [2] **Wu ZW**, Chu KH, Ma KY. Transcriptome analysis of multiple tissues of *Penaeus vannamei* reveals the typical physiological response to the invasion of three pathogens, THE 16th SYMPOSIUMOF CRUSTACEAN SOCIETY, 12-13 Nov 2022, Heibei Province, China (oral presentation).
- [3] **Wu ZW**, Chu KH, Ma KY. Transcriptome analysis of multiple tissues of *Penaeus vannamei* reveals the typical physiological response to the invasion of three pathogens, Dialogue with fantastic creatures—SYSU&HKU paleontology theme workshop, 15-17 Oct 2022, Guangdong Province, China (oral presentation).

Additional Experience (Click for More Information)

1. Undergraduate Ecological Comprehensive Experiment Mar. 2023 - Jun. 2023
   Laboratory Assistant in the 2022 spring semester High-Throughput Sequencing Module
2. Undergraduate Biochemical Experiment Oct. 2022 - Jan. 2023
   Laboratory Assistant in the 2022 autumn semester Biochemical Experiment
3. English - Chinese translation of a sustainable development report Oct. 2022 - Nov. 2022
   United Nations Volunteers Translator
4. Undergraduate Ecological Comprehensive Experiment Mar. 2022 - Jun. 2022
   Laboratory Assistant in the 2021 autumn semester High-Throughput Sequencing Module

Skills and Hobbies

Software: Proficient in R (Preferred for analysis and plotting), Strong command of Perl programming (Primary tools), Familiar with Python (Supplementary tools), Limited exposure to Java
Hobbies: Avid Reader & Passionate Cook & Food Enthusiast & Cat Lover

Stay curious forever, be willing to embrace everything, and excel at learning from scratch.