Jiahao Ma

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EDUCATION

***Harbin Institute of Technology, Weihai, China* (HIT)**

BEng in Biological Engineering (Elite Class) Sept 2019-July 2023 (Expected)

***Yantai Institute of Coastal Zone, Chinese Academy of Science* (YIC)**

Undergraduate Joint Training Program Sept 2022-July 2023 (Expected)

PUBLICATION

- **Jiahao Ma**, Guotong Xu, Le Ao, et al. Bioinformatic analysis for structure and function of Glutamine synthetase GS from Antarctic Sea ice bacterium *Pseudoalteromonas* sp. M175[R]. paper presented at t*he 4th International Conference on Biotechnology and Biomedicine (ICBB 2022)*, China, March 2022.
- Xingfeng Du, **Jiahao Ma**, et al. Feasibility study on the application of biological flocculation technology in nitrogen removal in marine circulating aquaculture[J]. *Tech wind*, 2021 (7):116-118.
- **Jiahao Ma**. The Origin and Development Trend of Human Sex Chromosomes: Reflections and Discussions From Biology Textbooks[J]. *Biological Bulletin*, 2018, 53 (8):48-51.
- **Jiahao Ma**, et al. Interactive learning content generation system based on pre-trained models[P]. China, Invention patent, 202210382031.2, 2022.4.12.
- **Jiahao Ma**, Jun Ma, Jinting Zou, Shuxuan Yang, Cheng Zhang, et al. AI generation system for interactive learning content [P]. China, Software copyright.
- **Jiahao Ma**, Xiangfei Meng, Guangfeng Kan, et al. Scanning Electron Microscopy and Metabolite Measurement Revealed the Stress Mechanism of PS-COOH Microplastics on *Rhodotorula mucilaginosa* AN5. arXiv:2205.03583 (preprint)

RESEARCH EXPERIENCE

Impact of Microplastics on Antarctic yeast *Rhodotorula mucliaginosa* AN5 Oct 2020 - Now

Supervisor: Prof. Guangfeng Kan

- The effect of Microplastic (PS-COOH) on the morphology of marine microbial cell bodies (Antarctic ice yeast) was investigated by using SEM for the first time.
- The maximum concentration of yeast was found to decrease by 38% and the growth cycle prolong by 14 h under the stress of plastic microspheres.
- The differences in Metabolome and metabolite in yeast subjected to microplastic stress were treated and analyzed by CG-MS and LG-MS; 14 groups of stress compounds were found by PCA analysis.
- When treated with 10mg/L nano plastic, the concentration of yeast cell stress compounds (SOD, ROX) increased by about 50%, which can indicate the occurrence of membrane damage.
- The key results were preprinted in arXiv, with the title “Scanning Electron Microscopy and Metabolite Measurement Revealed the Stress Mechanism of PS-COOH Microplastics on *Rhodotorula mucilaginosa* AN5”.

Bioinformatic Analysis for Structure and Function of Glutamine Synthetase (GS) from Antarctic Sea Ice Bacterium *Pseudoalteromonas* sp. M175 Nov 2019 - Oct 2020

Supervisor: Dr. Xiaofei Wang

- The GS sequence from the Antarctic Sea ice bacterium was analyzed to understand the mechanisms of microbial adaptation to extreme environments.
- Secondary structure is predicted by SOPMA, which showed 35.04% α-helix, 16.67% Extended chain，5.34% β-turn 、42.95% RandomCoil composition
- A three-dimensional analog structure with six subunits and a ring was established by SWISS-MODEL.

- 12 different proteins close to the enzyme sequence were found by NCBI SMART-BLAST.
- The key results were summarized and published in ICBB 2022, with the title “Bioinformatic analysis for structure and function of Glutamine synthetase GS from Antarctic Sea ice bacterium *Pseudoalteromonas* sp. M175”.

Feasibility Inquiry on the Application of Biological Flocculation Technology in Marine Recycling Aquaculture
Supervisor: Prof. Guangyu Wang Oct 2020 - Feb 2021

- Explored the possibility of biological flocculation technology applied in nitrogen removal in marine circulating aquaculture.
- In the case of insufficient feed, bioflocculant was used to increase the total biomass of sea cucumber by 20% and the mortality of the sea cucumber population using bioflocculant decreased by more than 5%.
- The use of bioflocculant reduced the free nitrogen by more than 8%, which was measured by spectrophotometry.
- The key results were summarized and published in *Tech Wind, 2021[2]* with the title "Feasibility Inquiry on the Application of Biological Flocculation Technology in Marine Recycling Aquaculture".

Establishment of the set PCC 6803 signal transduction database June 2021 - Now
Supervisor: Prof. Song Qin and Dr. Yinchu Wang

- An efficient index of set cell algae signal transduction database was established by graph database.
- Literature research was used to look for the PCC 6803 signal transduction node & relationship and over 200 nodes were implemented.
- The set PCC 6803 signaling database was presented using Cytoscape and neo4j.

Jane Street Market Prediction model research Dec 2020 - Feb 2021
Supervisor: Dr. Zhang Shuo

- American Stock in Jane Street Market Database was predicted by using CNN, RNN, LGB and merged model; The accuracy was calculated to be over 56%.
- The models from 3 different NNs were merged to get the highest month forecast of the U. S. stock market precision of the world's top percent.

AWARD

- Baidu April Propeller RNA Base Unpaired Probability Prediction 1st (2022).
- Baidu AI Studio MarTech Anti Fraud Challenge Track 2 Competition 67th (2020).
- Second Prize of Marine Science Knowledge Contest Qualifier (2019).
- Chemistry Olympiad Division Second Prize and Province First Prize (2018).
- Biology Olympiad Division Second Prize and Province First Prize (2018).

SKILL

- Proficiently in microbial cultivation, machine-learning, Pytorch, AI studio, origin lab, and Cytoscape.
- Familiar with LC-MS, MEGA, Gel Electrophoresis, C/Cpp, R, Matlab and Protein Extraction.
- Intermediate level in SEM, PCR, DNA sequencing, Biopython, Kali Linux, bioflocculation, neo4j and GC-MS.

WORK EXPERIENCE

- CIO and Director of "Shandong Zanbao Agricultural Science and Technology Co., Ltd."

  Jun 2020 - Nov 2021
- Intern Editor of Gold Star Education Co., Ltd. Feb 2020 - May 2020