

FANGTONG MEI

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EDUCATION

Columbia University

New York, NY

MS in Earth and Environmental Engineering, 3.92/4.00

Dec 2025

Courses: Machine Learning, Engineering Applications of Electrochemistry, Electrochemical Materials and Devices (audit)

Hohai University

Nanjing, CN

BS in Environmental Science, 83.29/100

Jun 2023

Courses: basic Chemistry, Environmental Microbiology, Water Treatment Engineering

ACADEMIC EXPERIENCE

Enhancing Anode Wettability in Li-S Solid-State Batteries

Columbia Electrochemical Energy Center

Advisor: Prof. Daniel Steingart, Dr. Kerry Sun

Feb 2025 - Present

- Developed low-cost slurry-processed interlayers for Li/LLZTO solid-state batteries, systematically screening active components (C-Ag, Sn-Bi-Ag and Al-Ag alloys) and optimizing solvent/binder systems (NMP/PVDF, CMC, Li-PAA), carbon-to-alloy ratios, and particle-size distributions to control viscosity, reactivity, and coating uniformity
- Established a reproducible mixing, casting, and cell-assembly workflow for Li/LLZTO symmetric and full cells, integrating DSC, EIS, galvanostatic cycling, and cyclic voltammetry to quantify interfacial resistance, stability, and cycling behavior
- Correlated alloy formation and interfacial morphology from SEM with electrochemical performance, elucidating how interlayer composition and microstructure govern contact quality, reaction-layer formation, and long-term wettability at the Li/oxide interface
- Proposed the in-situ formation of Li-Ga alloy at the lithium metal anode to construct a three-dimensional percolating interfacial network coating

Morphology Evolution in Zinc Electrodeposition

Columbia Electrochemical Energy Center

Advisor: Prof. Daniel Steingart

May 2025 - Present

- Built an Arduino-controlled in-situ imaging platform for metal electrodeposition synchronized with potentiostatic testing, designing and fabricating transparent-channel and capillary cells, and optimizing optical viewing angles and cell geometry to enable real-time, high-resolution observation of interfacial morphology.
- Systematically investigated zinc deposition in both aqueous and non-aqueous electrolytes under different applied voltages, establishing a time-resolved image analysis workflow that quantitatively correlates morphology evolution with electrode potential and constructing an in-situ image dataset for mechanistic studies.
- Focused on the initial stage from a bare metal interface to nucleation and early growth, identifying characteristic growth pathways at different potentials and proposing a testing scheme that delineates deposition regimes based on potential-morphology differences, providing experimental guidance for subsequent interface-evolution modeling and electrode design.

Simulation Research on Initial Rainwater Treatment System

Hohai University

Advisor: Prof. Wenlong Zhang

Dec 2022 - May 2023

- Developed a 2D multiphase CFD model integrating RNG k- ϵ turbulence and VOF multiphase flow models to simulate a lateral-flow inclined plate sedimentation tank.
- Analyzed the tank's performance under various hydraulic loads, identifying key inefficiencies including vortex formation, dead zones, upward flow, and uneven inflow patterns.
- Proposed a cost-effective optimization strategy concluding the ideal plate spacing should be selected based on the influent's primary particle size distribution.

Glycine Methylation Pathway for Salt Tolerance in Thioalkali

Chinese Academy of Science

Advisor: Prof. Yanning Zheng

Jun 2021 - Jul 2021

- Cloned, expressed, and purified two core N-methyltransferases (TvGMT and TvSDMT) and performed enzyme activity assays to clarify functions in the glycine betaine synthesis pathway.
- Employed High-Performance Liquid Chromatography to quantify cellular metabolites, revealing a about 40-fold increase in glycine betaine production under high-salt stress.

SKILLS

- Software: Python, Arduino, R, QGIS, ANSYS, Visio CAD, Chemdraw
- Lab skills: Working experience in Argon glovebox, fluent in Arduino board, basic cell test and chara, etc.
- Language: English(Fluent), Chinese(Native)

PUBLICATIONS

- Liu, M., Liu, H., Mei, F., Yang, N., Zhao, D., Ai, G., Xiang, H. and Zheng, Y., 2022. Identification of the biosynthetic pathway of glycine betaine that is responsible for salinity tolerance in halophilic *Thioalkalivibrio versutus* D301. *Frontiers in Microbiology*, 13, p.875843.

AWARDS

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| • Hohai University Award for Outstanding Bachelor's Thesis | 2023 |
| • 'HOHAI CUP' Basketball tournament Champion , most Valuable Player | 2023 |
| • Academic Progress Award (Environment college of Hohai University) | 2022 |
| • Sports and Arts Award (Environment college of Hohai University) | 2021 2022 |