

# Lingfeng ZHANG

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## EDUCATION

- **Wuhan University** Wuhan, China  
*Psychiatry, M.S., Psychiatry and Mental Health, Advisor: Prof. Zhongchun Liu* Sep 2023 - Jun 2026
- **Central South University** Changsha, China  
*B.M., Clinical Medicine, Advisor: Prof. Qiming Liu* Sep 2018 - Jun 2023

## PUBLICATIONS

- Zhang, L.**, Liu, Z., et al., Multi-omics insights in major depressive disorder: Dysfunction of Neurons. *medRxiv*, 2025. [\[Paper\]](#)
- Zhang, L.**, Liu, Z. et al., Exploring glucagon-like peptide-1 receptor agonists as potential disease-modifying agent in psychiatric and neurodevelopmental conditions: evidence from a drug target mendelian randomization. *BMC Psychiatry*, 2025. [\[Paper\]](#)
- Ma, S., **Zhang, L.**, Liu, Z. et al., Towards precision psychiatry: identifying biological subtypes of depression through proteomics. *Commun. Med.*, 2025. (Under Review)
- Yuan, R., **Zhang, L.** et al. Adolescent Psychological Resilience and Non-Suicidal Self-Injury: A Moderated Mediation Model. *Chin. J. Clin. Psychol.*, 2024. [\[Paper\]](#)
- Zhang, L.**, et al. Research trends in transient receptor potential vanilloid in cardiovascular disease: Bibliometric analysis and visualization. *Front. Cardiovasc. Med.*, 2023. [\[Paper\]](#)

## ACADEMIC EXPERIENCES

- **Investigating Neuronal Dysfunction in Major Depressive Disorder Through Multi-Omics Integration** Wuhan University  
*Advisor: Prof. Zhongchun Liu, Department of Psychiatry, Renmin Hospital of Wuhan University* Sep 2023 - Present
  - Integrated multi-omics datasets including scRNA-seq, GWAS summary statistics, and UK Biobank plasma proteomics to identify 273 MDD-associated eQTLs and prioritize MDD-relevant subtypes.
  - Define meta-programs in excitatory and inhibitory neurons by non-negative matrix factorization, uncovering transcriptional modules linked to synaptic plasticity, neuronal connectivity, and epigenetic regulation; conducted trajectory analysis to reveal pathological states in neuronal subtypes.
  - Characterized a *CXCL14*<sup>+</sup> inhibitory neuron subtype involved in stress response and cell-cell communication; validated 26 risk genes through proteomics, with 5 protein-coding genes predictive of patient prognosis using CoxBoost regression.
- **Exploring glucagon-like peptide-1 receptor agonists as potential disease-modifying agents in psychiatric and neurodevelopmental conditions** Wuhan University  
*Advisor: Prof. Zhongchun Liu, Department of Psychiatry, Renmin Hospital of Wuhan University* Sep 2023 - Sep 2024
  - Conducted Mendelian randomization analysis to evaluate the potential effects of GLP-1 receptor agonists on 12 psychiatric and neurodevelopmental disorders.
  - Integrated cis-eQTL and large-scale GWAS data from FinnGen, PGC, and UK Biobank; performed meta-analysis and sensitivity testing.
  - Identified risk-lowering associations with schizophrenia, PTSD, autism, and others, with opposing effect on OCD.
- **Excellent Doctor Training Program** Central South University  
*Advisor: Prof. Qiming Liu, Department of Cardiology, the Second Xiangya Hospital* Mar 2021 - Jun 2023
  - Participated in outpatient consultations and inpatient clinical practice under Prof. Qiming Liu's supervision in the Cardiology II Department; observed over ten catheter ablation procedures.
  - Developed proficiency in diagnosing and managing common cardiovascular diseases, as well as foundational skills in both wet-lab and bioinformatics methods.
  - Studied key interdisciplinary topics including advanced manufacturing technologies, biomaterials and biosensors, computational modeling, machine learning, and medical image segmentation.
- **Exploring the Relationship Between Adolescent Psychological Resilience and Non-Suicidal Self-Injury (NSSI): The Mediating Effect of Loneliness.** Central South University  
*Advisor: Prof. Yan Zhang, National Center for Mental Disorders, the Second Xiangya Hospital* Mar 2021 - Mar 2022

- Led a school-based study in Changsha examining whether psychological resilience protects against adolescent NSSI; designed protocols, localized validated scales, and coordinated data collection with local stakeholders.
- Recruited 1,100 participants and ensured data quality for 1,011 valid responses; conducted statistical analyses to examine mediation and moderation effects in adolescent NSSI. Using SPSS 26.0 to conduct statistical analyses including common method bias testing, correlation analysis, and binary logistic regression.
- Found a 22.35% NSSI prevalence; identified depression, anxiety, residence, loneliness, sleep problems, and low resilience as significant risk factors. Established a moderated mediation model showing sleep issues amplify loneliness's impact on NSSI and informed prevention strategies.

- **Exploring the Role and Mechanisms of Wnt1 in Postmenopausal Osteoporosis** Central South University  
Advisor: Prof. Tianlong Huang, the Second Xiangya Hospital Mar 2020 - Mar 2021
  - Developed an in vitro model of postmenopausal osteoporosis using MC3T3 cells and investigated the expression of the non-canonical Wnt1 signaling pathway.
  - Validated Wnt1 overexpression and its involvement in the mTOC1 pathway using molecular assays.

## SCHOLARLY CONTRIBUTION

Contributed to the development of *the 2025 Chinese Guidelines for the Diagnosis and Treatment of Bipolar Disorder* under the supervision of Prof. Zhongchun Liu. Responsible for drafting the background section, conducting literature reviews, integrating clinical evidence, and formulating treatment recommendations. Acknowledged for contributions in the final published guideline (not listed as an author).

## LAB EXPERIENCE

- **National Center for Mental Health, the Second Xiangya Hospital** Central South University  
Research Assistant Mar 2022 - Jun 2023
  - Supported clinical research by contributing to study design and statistical analysis.
  - Performed data management and outcome analysis using R and SPSS.
- **Hunan Institute of Cardiovascular Disease, the Second Xiangya Hospital** Central South University  
Research Assistant Mar 2021 - Mar 2022
  - Trained in the use of the Langendorff system for establishing an ex vivo cardiac perfusion model in mice.
  - Performed protein analysis of cardiomyocytes using techniques such as Western blotting and qPCR.

## CONFERENCES & PRESENTATIONS

- **The 21st Annual Conference of Chinese Psychiatrist Association** Hangzhou, China  
Member Apr 2025
- **Annual Meeting of the Psychiatry Branch of the Hubei Medical Association** Wuhan, China  
Member Dec 2024

## HONORS & AWARDS

- Outstanding Social Practice Team Award** Central South University, 2021
- Outstanding Student Award** Central South University, 2019
- First Prize Academic Scholarship** Central South University, 2019
- Zhangyuan Tungsten Industry Scholarship** hongyi Zhangyuan Tungsten Co., Ltd & Central South University, 2019

## SPECIALIZED SKILLS & INTERESTS

- **Programming & Data Analysis:** R, Python, Shell, LaTeX; PyTorch, TensorFlow, scikit-learn, pandas, numpy.
- **Bioinformatics Tools & Pipelines:** Seurat, Scanpy, ArchR, cNMF, Cell Ranger, Signac, PLINK, Snakemake.
- **Experimental Techniques:** Western blotting, qPCR, immunofluorescence, cell culture, animal handling.
- **Data Visualization:** ggplot2, matplotlib, seaborn.
- **Languages:** English (Fluent), Mandarin (Native).
- **Research Interests:** scRNA-seq, scATAC-seq, Spatial transcriptomics, GWAS, proteomics, deep learning.