

Ruoxi Li

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Education Background

Columbia University, Mailman School of Public Health

09/2023-05/2025

- Master of Science in Biostatistics
- **Relevant Coursework:** Probability, Statistical Inference, Biostatistical Methods I & II, Survival Analysis, Analysis of Longitudinal Data, Introduction to Randomized Clinical Trials, Pharmaceutical Statistics, Clinical Trial Methodology

Huazhong University of Science and Technology, Tongji Medical College, School of Public Health

09/2018-06/2023

- Bachelor of Medicine in Preventive Medicine

Publications

- **Li, R.**, Zhang, Q., Rao, A., Huo, Z., Da, W., Hao, X. (2023). The causal relationship between insomnia and major depressive disorder: a Mendelian randomization analysis. *Military Medical Journal of South China*, 37.02:140-3. (in Chinese)
- He, M., Fan, J., Zhou, R., Gao, G., **Li, R.**, et al. (2022). NLRP3/Caspase-1-Mediated Pyroptosis of Astrocytes Induced by Antipsychotics Is Inhibited by a Histamine H1 Receptor-Selective Agonist. *Frontiers in aging neuroscience*, 14, 847561.
- Zhou, R., He, M., Fan, J., **Li, R.**, Zuo, Y., et al. (2022). The role of hypothalamic endoplasmic reticulum stress in schizophrenia and antipsychotic-induced weight gain: A narrative review. *Frontiers in neuroscience*, 16, 947295.

Research Experience

Optimization of Joint Fairness Model through Angle-Based Similarity Penalty Integration

Graduate Practicum, Supervisor: Prof. Tian Gu

05/2024-Present

- Review fairness modeling approaches in supervised learning and develop a model optimizing the existing Joint Fairness Model with an Angle-Based Similarity Penalty, ensuring fairness and high prediction across diverse populations.
- Conducted Python simulations to evaluate the model against existing models across broad scenarios.

Expression profile of plasma microRNAs associated with polycyclic aromatic hydrocarbon exposure

Undergraduate Thesis, Supervisor: Prof. Tangchun Wu, Academician of Chinese Academy of Engineering

12/2022-05/2023

- Performed multivariable linear regression in R to explore the link between PAH exposure and plasma microRNA expression, then investigated associated gene functions through gene enrichment analysis to identify involved biological pathways.
- Conducted stratification and interaction analysis on potential confounders, including age, gender and smoking status, and performed Spearman rank correlation analysis to assess the interrelationships among OH-PAH concentrations.
- Wrote an thesis analyzing the effects of PAH exposure on genetic expression and its potential health impacts. [\[thesis link\]](#)

The Effect of Antipsychotics on Astrocyte Pyroptotic Signaling & Molecular Mechanisms

Research Assistant, Supervisor: Prof. Meng He

01/2021-01/2023

- Assisted with data collection from the experiment and supported the statistical analysis process, including one-way ANOVA and Dunnett's t-test in SPSS. Contributed to result interpretation and to the publication. [\[publication link\]](#)
- Contributed to a literature review regarding the role of hypothalamic stress in antipsychotic-induced weight gain. [\[review link\]](#)

The Causal Relationship between Insomnia and Major Depressive Disorder: A Mendelian Randomization Analysis

Student Researcher & Program Leader, Supervisor: Prof. Chaolong Wang

04/2020-04/2022

- Initiated and led the funded provincial Undergraduate Training Program in Innovation and Entrepreneurship.
- Organized Genome-wide association studies data of 700,000 individuals from UK Biobank and Million Veteran Program in R and conducted bidirectional Mendelian randomization analysis to study the causal relationship between insomnia and major depressive disorder, resulting in a first-author publication. [\[publication link\]](#)

Academic Projects

Efficacy Comparison and Dose-Response Analysis in Clinical Trials

01/2024-03/2024

- Used CMH tests and a gate-keeping procedure to identify efficacy and dose-response relationship for a test drug.
- Utilized CMH tests, ANCOVA, and Kaplan-Meier analyses to compare efficacy of two treatments in rheumatoid arthritis.
- Conducted ANOVA in SAS to assess bioequivalence in a cross-over clinical trial for a test drug. [\[reports link\]](#)

Duloxetine Versus Escitalopram in Generalized Anxiety Disorder: A Randomized Controlled Trial

10/2023-01/2024

- Proposed a phase III trial protocol, including determination of statistical analysis plan, sample sizes calculation, randomization methods, and double-blind procedures. Also developed the eCRF and the trial timeline. [\[proposal link\]](#)

Internships

Data Science Intern, MSD China Holding Co., Ltd.

07/2024-08/2024

- Employed time-series models, including Prophet and ARIMA, to visualize and forecast sales of Keytruda in R Shiny.
- Developed XGBoost models in Python to predict Gardasil monthly sales, reducing the monthly prediction error by 50%.

Medical Development Intern, Otovia Therapeutics Co., Ltd.

05/2024-06/2024

- Review and organization of clinical trial documents, also liaised with clinical trial sites to improve coordination.

Clinical Intern, Union Hospital, Huazhong University of Science and Technology

07/2021-01/2022

- Completed clinical rotations in Internal Medicine, Surgery, Obstetrics & Gynecology, Pediatrics, and Infectious Diseases.

Skills

- **Tools:** R Programming, Python, SAS (SAS Certified Professional: Advanced Programming Using SAS 9.4), SPSS, SQL, PASS