Ze (Lake) Li

PhD. Student in Biology

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Research Interests

Molecular Evolution and Ancestral System Reconstruction of Purine Metabolism

Current Project

Evolution and Medical Application of Ancestral Xanthine Oxidoreductase and Ancestral Urate Oxidase

Education

In Progress	Ph.D.	Molecular Genetics and Biochemistry	Georgia State University
2016	B.S.	Biological Sciences	Taishan University

Publications

Li, Z., Hoshino, Y., Tran, L., & Gaucher, E. A. (2022). Phylogenetic Articulation of Uric Acid Evolution in Mammals and How It Informs a Therapeutic Uricase. *Molecular Biology and Evolution*, 39(1).

Mao, Y., Wu, X., An, L., Li, X., Li, Z., & Zhu, G. (2018). Tamoxifen activates hypothalamic l-dopa synthesis to stimulate ovarian estrogen production in chickens. *Biochem Biophys Res Commun*, 496(4), 1257-1262.

Contributed Publications (Acknowledgments)

Tran, L., Das, S., Zhao, L., Finn, M. G., & Gaucher, E. A. (2023). Oral Delivery of Nanoparticles Carrying Ancestral Uricase Enzyme Protects against Hyperuricemia in Knockout Mice. *Biomacromolecules,* 24(5), 2003-2008.

de Lima Balico, L., & Gaucher, E. A. (2021). CRISPR-Cas9-mediated reactivation of the uricase pseudogene in human cells prevents acute hyperuricemia. *Molecular Therapy - Nucleic Acids*, 25, 578-584.

Honors/Achievements

2024	Judge of poster presentations, 18th Georgia State Undergraduate Research Conference
2023	Selected into Peer Review Training Program of Genetics Society of America Journals
2023	Cellular and Molecular Biology & Physiology Award for Graduate Student, Georgia State University (2nd time)
2022	Molecular Basis of Disease PhD Fellowship, Georgia State University
2022	Cellular and Molecular Biology & Physiology Award for Graduate Student, Georgia State University
2021	Admitted PhD Candidacy, Georgia State University

Projects

2018-2022	‘Evaluation of urate metabolism in mammals’ Supported by the National Institutes of Health (R01AR069137) PI/Supervisor: Dr. Eric A. Gaucher
2016	‘Regulation of 3β-HSD gene in progesterone synthesis during development and regression of chicken follicles’ Supported by the National Natural Science Foundation of China [31301974] PI/Supervisor: Dr. Guiyu Zhu
2015-2016	‘Construction of a new promoter trapping system based on metagenome and its application in Nissle1917’ Supported by the National Natural Science Foundation of China [31300090]

PI/Supervisor: Dr. Jijian Yang

Invited Talks

2024 PhD Student Presentation, Biology Department Open House, Georgia State University

Conferences

Oral Presentation

2024 Molecular Basis of Disease PhD Fellowship Retreatment

Poster Presentation

2022 Graduate Conference for Research, Scholarship and Creative Activity at Georgia State University

2022 CGHI Innovation Summit at Atlanta

Attendee

2024 2024 Suddath Symposium: The Evolution of Multicellularity and Cellular Differentiation at Georgia Institute of Technology

2023 13th Annual Southeast Enzyme Conference at Georgia State University

2019 Evolution of Complex Life at Georgia Institute of Technology

Internship

2016 Advisor: Dr. Youfei Shi
Pharmacology and Cellular Biology
Shandong Agricultural University

Memberships

2022 Society for Molecular Biology & Evolution

Workshops

2024 Quantitative Biosciences Modeling Workshop (Using AlphaFold 2 to Model Protein-Protein Interactions), Georgia Institute of Technology

2024 Atlanta Workshop For Single-Cell Omics Featuring AI and Machine Learning, Georgia Institute of Technology

2023 Quantitative Biosciences Modeling Workshop (Machine Learning for viral molecular dynamics), Georgia Institute of Technology

2023 8th Workshop on Biostatistics and Bioinformatics, Georgia State University

2022 Quantitative Biosciences Modeling Workshop (Stochasticity in gene expression), Georgia Institute of Technology

Abilities and Skills

Laboratory Skills

Evolutionary and Phylogenetic Analysis
Protein Expression, Purification and Quantification
Steady-state Enzymatic Kinetics

From Graduate-level Classes (At Georgia State University)

Python and Machine Learning (BIOL 8630)
MATLAB and Mathematical Biology (BIOL 6010, MATH 8505) and System Biology (MATH 8500)
Mathematical Statistics (MATH 6547, MATH 6751, MATH 6752)

Assistantships

Graduate Research Assistantship

2017-2018 Advisor: Dr. Chun Jiang
Cellular Physiology, Neuroscience and Pharmacology
Georgia State University

Graduate Teaching Assistantship (at Georgia State University)

2023 Spring BIOL 3910 'Genetics Laboratory (CRISPR/Cas9 section)', lead TA
2022 Fall BIOL 3810 'Molecular Cell Biology Laboratory'
2022 Spring BIOL 3910 'Genetics Laboratory (CRISPR/Cas9 section)'
2018-2021 BIOL 3910 'Genetics Laboratory'
2021 Spring BIOL 3890 'Microbiology Laboratory'
2020 Fall BIOL 2310 'Fundamental Microbiology Laboratory'

Graduate Teaching Assistant Apprenticeship (at Georgia State University)

2022 Spring BIOL 2108 'Principles of Biology II Laboratory'
2021 Fall BIOL 2107 'Principles of Biology I Laboratory'

Pedagogy/Undergraduate Course Design

Genetics Laboratory — *In vivo* CRISPR/Cas9 yeast genome editing including 3rd generation Nanopore sequencing and bioinformatics, one-semester course