Yuanxi Yu



Postdoctoral Researcher, SJTU | Founder, Spiritein

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+86 13262282663 | Shanghai, China | Born: February 1998
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Research focus: AI-assisted directed evolution of proteins.

Experience

Current	**Founder, Spiritein**
Mar 2025 - Present	**Postdoctoral Researcher**, Shanghai Jiao Tong University Supervisor: Prof. Liang Hong

Education

2020 - 2025	**Ph.D.**, School of Physics and Astronomy, Shanghai Jiao Tong University Advisor: Prof. Liang Hong
2016 - 2020	**B.Sc.**, Shanghai Jiao Tong University
Mar - Sep 2024	**Visiting student**, University of Birmingham, UK Host: Dr. Jinglai Li

Titles

Recipient, Zhiyuan Honors Doctorate Program, Shanghai Jiao Tong University

Shanghai "Super Postdoctoral" Incentive Program, 2025

Expert Pool Member, Data Elements Division, Shanghai Data Bureau, 2025

Awards

Outstanding Graduate of Shanghai, 2024

National Scholarship, Shanghai Jiao Tong University, 2024

National Scholarship, Shanghai Jiao Tong University, 2022

Outstanding Graduate of Shanghai Jiao Tong University, 2020

Other Activities

China International College Students' Innovation Competition (2023, 9th edition) - Shanghai Gold Prize

2025 "Data Element X" Contest - First Prize, Scientific and Technological Innovation Track

2026 "Data Element X" Contest - First Prize, Scientific and Technological Innovation Track

Published papers | 2026-2025

15 published papers in total. # Equal contribution; * Corresponding author.

01. Deep learning-guided dual-fitness evolution of T7 RNA polymerase for enhanced stability and activity

Fan Jiang, Liqi Kang, Mingchen Li, Bozitao Zhong, Xiaoxia Chen, Banghao Wu, Mengrong Li, **Yuanxi Yu***, Liang Hong*

Nucleic Acids Research, **54**(6), gkag259, 2026

Published article | PubMed

02. Venus-MAXWELL: Efficient Learning of Protein-Mutation Stability Landscapes using Protein Language Models

Yuanxi Yu#, Fan Jiang#, Xinzhu Ma, Liang Zhang, Bozitao Zhong, Wanli Ouyang, Guisheng Fan, Huiqun Yu, Liang Hong*, Mingchen Li*

NeurIPS Poster, 2025

Conference paper | Preprint (bioRxiv) | Code

03. VenusMutHub: A systematic evaluation of protein mutation effect predictors on small-scale experimental data

Liang Zhang, Hua Pang, Chenghao Zhang, Song Li, Yang Tan, Fan Jiang, Mingchen Li, **Yuanxi Yu**, Ziyi Zhou, Banghao Wu, Bingxin Zhou, Hao Liu, Pan Tan, Liang Hong*

Acta Pharmaceutica Sinica B, 2025

Published article

04. Conductivity-Viscosity Decoupling in Concentrated LiTFSI and LiCl Electrolytes

Yuchen Sun, Liqi Kang, **Yuanxi Yu**, Liang Hong, Zhuo Liu*

ChemPhysChem, 2025

Published article

05. PRIME, a temperature-guided language model revolutionizes protein engineering

Yuanxi Yu, Qianhui Wang, Yike Zou*

Acta Pharmaceutica Sinica B, 2025

Full text (PMC)

06. A Deep Retrieval-Enhanced Meta-Learning Framework for Enzyme Optimum pH Prediction

Liang Zhang, Kuan Luo, Ziyi Zhou, **Yuanxi Yu**, Fan Jiang, Banghao Wu, Mingchen Li, Liang Hong*

Journal of Chemical Information and Modeling, 2025

Published article

07. Entropy-driven zero-shot deep learning model selection for viral proteins

Yuanxi Yu#, Fan Jiang#, Bozitao Zhong, Liang Hong*, Mingchen Li*

Physical Review Research, 2025

Published article

Published papers | 2024-2020

# Equal contribution; * Corresponding author.

08. A general temperature-guided language model to design proteins of enhanced stability and activity

Fan Jiang#, Mingchen Li#, Jiajun Dong#, **Yuanxi Yu#**, Xinyu Sun#, Banghao Wu#, Jin Huang, Liqi Kang, Yufeng Pei, Liang Zhang, Shaojie Wang, Wenxue Xu, Jingyao Xin, Wanli Ouyang, Guisheng Fan, Lirong Zheng, Yang Tan, Zhiqiang Hu, Yi Xiong, Yan Feng, Guangyu Yang, Qian Liu, Jie Song, Jia Liu, Liang Hong, Pan Tan

Science Advances, 2024

Published article

09. Emergence of Debye scaling in the density of states of liquids under nanoconfinement

Yuanxi Yu, Sha Jin, Xue Fan, Mona Sarter, Dehong Yu, Liang Hong*, Matteo Baggioli*

ACS Nano, 2024

Published article

10. On the temperature dependence of the density of states of liquids at low energies

Sha Jin, Xue Fan, Caleb Stamper, Richard A. Mole, **Yuanxi Yu**, Liang Hong, Dehong Yu, Matteo Baggioli

Scientific Reports, **14**, 18805, 2024

Published article

11. Enhancing efficiency of protein language models with minimal wet-lab data through few-shot learning

Ziyi Zhou#, Liang Zhang#, **Yuanxi Yu#**, Banghao Wu#, Mingchen Li, Liang Hong, Pan Tan

Nature Communications, 2024

Published article

12. The evolution of anionic nanoclusters at the electrode interface in water-in-salt electrolytes

Lei Zhang#, **Yuanxi Yu#**, Liumin Suo, Wei Zhuang, Lunhua He, Xiaohua Zhang, Liang Hong, Pan Tan

Physical Chemistry Chemical Physics, 2023

Published article

13. The ω^3 scaling of the vibrational density of states in quasi-2D nanoconfined solids

Yuanxi Yu, Chenxing Yang, Matteo Baggioli, Anthony E Phillips, Alessio Zaccone, Lei Zhang, Ryoichi Kajimoto, Mitsutaka Nakamura, Dehong Yu, Liang Hong

Nature Communications, 2022

Published article

14. Solid-like nano-anion cluster constructs a free lithium-ion-conducting superfluid framework in a water-in-salt electrolyte

Pan Tan, Jinming Yue, **Yuanxi Yu**, Binghang Liu, Tao Liu, Lirong Zheng, Lunhua He, Xiaohua Zhang, Liumin Suo, Liang Hong

The Journal of Physical Chemistry C, 2021

Published article

15. Heterogeneity of Water Molecules on the Free Surface of Thin Reduced Graphene Oxide Sheets

Zhuo Liu, Chenxing Yang, Lei Zhang, **Yuanxi Yu**, Minhao Yu, Victoria García Sakai, Madhusudan Tyagi, Takeshi Yamada, Lunhua He, Xiaohua Zhang, Liang Hong

The Journal of Physical Chemistry C, **124**(20), 11064-11074, 2020

Published article

Preprints and patents

6 preprints. # Equal contribution; * Corresponding author.

01. VenusGenome: Genome-Aware Masked Autoencoding for Microbial Genome Representation Learning
Liang Zhang#, Yukun Zhang#, Yang Tan, Fan Jiang, Bozitao Zhong, Xiaoran Cheng, Liang Hong*, Mingchen Li*, **Yuanxi Yu***
bioRxiv / arXiv, 2026
Preprint (bioRxiv) | Preprint (arXiv)

02. MAXWELL: Calibrating the probabilistic outputs of protein language models to the mutation-induced stability change landscape
Mingchen Li, Xiaoran Cheng, Meiyao Hong, Fan Jiang, Liang Hong, **Yuanxi Yu***
bioRxiv, 2026; updated November 6, 2026 (v2)
Preprint (bioRxiv)

03. A General Harness for Protein Foundation Model Fitness Prediction
Yang Tan, Qijia Tian, Gangyu Sun, Bozitao Zhong, Mingchen Li, **Yuanxi Yu**, Nanqing Dong, Liang Hong
arXiv, 2026
Preprint (arXiv)

04. Self-evolving AI agents for protein discovery and directed evolution
Yang Tan, Lingrong Zhang, Mingchen Li, **Yuanxi Yu**, Bozitao Zhong, Bingxin Zhou, Nanqing Dong, Liang Hong
arXiv, 2026
Preprint (arXiv)

05. Rank-and-Reason: Multi-Agent Collaboration Accelerates Zero-Shot Protein Mutation Prediction
Yang Tan, **Yuanxi Yu**, Can Wu, Bozitao Zhong, Mingchen Li, Guisheng Fan, Jiankang Zhu, Yafeng Liang, Nanqing Dong, Liang Hong
arXiv, 2026
Preprint (arXiv) | Code

06. Discovery of Expression-Governing Residues in Proteins
Fan Jiang#, Mingchen Li#, Banghao Wu, Liang Zhang, Bozitao Zhong, **Yuanxi Yu***, Liang Hong*
bioRxiv, 2025
Preprint (bioRxiv)

Patents

A creatinase mutant applied to creatinine detection, along with its mutation site selection, purification, and detection methods

CN117448306A | First inventor

A creatinase mutant with enhanced thermal stability and its applications

CN116694608A | First inventor

A T7 RNA polymerase mutant with high thermal stability and its applications

CN117070493A | Second inventor