

Xinkai Cai

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EDUCATION

Xiamen University & School of Life Sciences

Sep, 2025 - Present

Master of Engineering (M.Eng.)

Biological & Pharmaceutical Engineering

Fujian Agriculture and Forestry University & School of Life Sciences

Sep, 2021 - May, 2025

Bachelor of Science (B.Sc.)

Bioinformatics

Thesis: Green plants OFP gene family molecular evolution analysis: mining key genes for fruit shape regulation (Outstanding Dissertation)

Advised by Ping Zheng

RESEARCH

- (1) AI-driven biological data mining
- (2) Single-cell & spatial omics algorithm development
- (3) Epigenetic regulatory network modeling

PUBLICATION & PREPRINT

Genomics and transcriptomics

Identification and Characterization of *Hva22* Genes in Pineapple (*Ananas comosus* L.) Revealed Their Roles in Development Regulation and Cold Stress Response

Accepted and published online, BMC Plant Biol, 2025

<https://bmcplantbiol.biomedcentral.com/articles/10.1186/s12870-025-07562-y>

Hou Z#, Cai X#, Wu J, Lu L, Liu C, Zhang Y, et al

Identification and characterization of *GRAS* genes in passion fruit (*Passiflora edulis* Sims) revealed their roles in development regulation and stress response.

Accepted and published online, Plant Cell Reports, 2025

<https://doi.org/10.1007/s00299-025-03432-x>

Cai X#, Li D#, Liu C#, Chen J, Wei X, Hu S, et al.

The *GRAS* gene family and its roles in pineapple (*Ananas comosus* L.) developmental regulation and cold tolerance

Accepted and published online, BMC Plant Biol, 2024

<https://doi.org/10.1186/s12870-024-05913-9>

Lin J#, Wu J#, Zhang D#, Cai X, Du L, Lu L, et al.

From gene expression to flower patterns: genome-wide characterization of the *MADS*-box gene family in passion fruit (*Passiflora edulis*)

Accepted and published online, Tropical Plants, 2024

<https://doi.org/10.48130/tp-0024-0004>

An C#, Liao J#, Lu L#, Cai X, Liu R, Chen S, et al.

Metabolomics

Comparative Metabolomics Analysis of Four Pineapple (*Ananas comosus* L. Merr) Varieties with Different Fruit Quality

Accepted and published online, Plants (Basel), 2025

<https://doi.org/10.3390/plants14152400>

Zheng P, Wu J, Li D, Xie S, Cai X, Xiao Q, et al

Revealing Further Insights into Astringent Seeds of Chinese Fir by Integrated Metabolomic and Lipidomic Analyses

Accepted and published online, Int J Mol Sci, 2023

<https://doi.org/10.3390/ijms242015103>

Zheng P, Shen M, Liu R, Cai X, Lin J, Wang L, et al.

Medicinal Chemistry

Inhibition mechanism of water extract from spent mushroom substrate against Phytophthora infestans in potatoes

Accepted and published online, J Chin Agric Sci Technol, 2024

<https://www.nkdb.net/CN/Y2024/V26/I5/129>

Mo W, Hong C, Gui F, Hong C, Cai X, Guan X, et al.

Construction and antibacterial effect evaluation of nano TiO₂-loaded moxifloxacin hydrochloride system

Accepted and published online, J Chin Agric Sci Technol, 2024

https://journal05.magtech.org.cn/Jwk_ny/EN/10.3969/j.issn.1674-7968.2024.02.019

Huang H, Guo X, Xu J, Li Q, Cai X, Guan X, et al.

Study on the adsorption of heavy metal nickel by biochar prepared from three kinds of bran

Accepted and published online, Chin Agric Sci Bull, 2023

<https://arxiv.org/abs/2205.11691>

Hong C, Hong C, Mo W, Cai X, Gui F, Guan X, et al.

A method for preparing an extraction solution with antibacterial activity against pathogenic pathogenic fungi

Patent application published: CN 117426397 A, 2024

Mo W, Hong C, Gui F, Hong C, Cai X, Guan X, et al.

A method for preparing biochar from waste mushroom bran as raw material

Patent application published: CN 118771347 A, 2024

Hong C, Mo W, Hong C, Gui F, Cai X, Guan X, et al.

A nano silver chloride material with high antibacterial activity prepared from bacterial bran extract

Patent application published: CN 116375077 A, 2023

Mo W, Gui F, Cai X, Hong C, Hong C, Guan X, et al.

**HONOR &
AWARD**

Outstanding Undergraduate Thesis (Design)

2025

Fujian Agriculture and Forestry University

Third Prize, 9th National College Student Life Sciences Competition Jul, 2024

Third Prize, 8th National College Student Life Sciences Competition Jun, 2023

Third-Class Outstanding Student Scholarship

2022- 2023

Fujian Agriculture and Forestry University

Third Prize, 18th “Challenge Cup” National Undergraduate Extracurricular Academic Science and Technology Works Competition

Dec, 2023

National College Student Innovation and Entrepreneurship Training Program (Completed Project)

Jul, 2023

Grand Prize, 16th Fujian Province “Challenge Cup” Competition

May, 2023

First Prize, 2nd “Challenge Cup” College of Plant Protection Technological Invention Competition

Feb, 2023

Fujian Agriculture and Forestry University

SERVICE

BMC Plant Biology (2025)

Review