Xiongjie Zheng

Nationality: People's Republic of China
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Current Address

Huazhong Agricultural University,
No.1, Shizishan Street, Hongshan District, Wuhan city, Hubei Province, 430070, P.R.China

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Research Interests

1) Elucidation of uncharacterized biosynthetic pathways of bioactive secondary metabolites (*e.g.*, crocin and carotenoid pigments, coumarins and triterpenoids) in horticultural plants.

2) Exploring the genetic, evolutionary, and biochemical basis of the diversity of high-value secondary metabolites in horticultural plants.

3) Developing new strategies for efficient bio-production of metabolites, pharmaceuticals for the benefit of human health, as well as for engineering crops for sustainable horticulture and agriculture.

Education

September 2012~ December 2018
Ph.D. Genetic Engineering and Molecular Biology of Fruit Crop
College of Horticulture and Forestry Sciences,
Huazhong Agricultural University
Advisor: Professor Xiuxin Deng

January 2018~ January 2019
Visiting Ph.D. student, Carotenoid biosynthesis and regulation
Dept. of Biological Sciences, Royal Holloway, University of London.
Advisor: Professor Paul Fraser

Professional Profile

2024-present: Associate professor, College of Horticulture and Forestry Science, Huazhong Agricultural University, China.

2019-2024: Postdoctoral Fellow, Center for Desert Agriculture, Biological and Environmental Science and Engineering, King Abdullah University of Science and Technology (KAUST), Kingdom of Saudi Arabia.

Publications

Peer-reviewed articles

(28) Yu, P*., **Xiongjie Zheng*(*co-first author).**, Alimi, L. O., Al-Babili, S., & Khashab, N. M. (2024). Metal–Organic Framework-Mediated Delivery of Nucleic Acid across Intact Plant Cells. ***ACS Applied Materials & Interfaces*****,** *16*(15), 18245-18251.

(27) Ablazov, Abdugaffor, Muhammad Jamil, Imran Haider, ……**Xiongjie Zheng**…... Mark Tester, Ikram Blilou, Salim Al-Babili (2024) Zaxinone Synthase overexpression modulates rice physiology and metabolism, enhancing nutrient uptake, growth and productivity. ***Plant, Cell & Environment***.

(26) Liu, Y., Ye, J., Zhu, M., Atkinson, R. G., Zhang, Y., **Xiongjie Zheng.**, ... & Zeng, Y. (2024). Multi-omics analyses reveal the importance of chromoplast plastoglobules in carotenoid accumulation in citrus fruit. ***The Plant Journal***, 117(3), 924-943.

(25) Boutoub, O., Jadhav, S., **Xiongjie Zheng**., El Ghadraoui, L., Al Babili, S., Fernie, A. R., ... & Borghi, M. (2024). Biochemical characterization of Euphorbia resinifera floral cyathia. ***Journal of Plant Physiology***, 293, 154184.

(24) Mi, J., & **Xiongjie Zheng**. (2023). New analytical strategies in plant metabolites analysis. ***Frontiers in Plant Science***, *14*, 1332622.

(23) **Xiongjie Zheng**, Yasha Zhang, Aparna Balakrishna, Kit Xi Liew, Hendrik N.J. Kuijer, Ting Ting Xiao, Ikram Blilou, Salim Al-Babili. (2023) Installing the Neurospora carotenoid pathway in plants enables cytosolic formation of provitamin A and its sequestration in lipid droplets. ***Molecular Plant.*** 16, 1066-1081.

(22) Zhu, K., Feng, Y., Huang, Y., Zhang, D., Ateeq, M., **Xiongjie Zheng**, ... & Liu, J. (2023). β-Cyclocitric acid enhances drought tolerance in peach (*Prunus persica*) seedlings. ***Tree Physiology***, 43(11), 1933-1949.

(21) Song, J., Sun, B., Chen, C., Ning, Z., Zhang, S., Cai, Y., **Xiongjie Zheng** ... & Zhu,

Z. (2023). An RR-type MYB transcription factor promotes nonclimacteric pepper fruit carotenoid pigment biosynthesis. ***The Plant Journal***. 115(3), pp.724-741.

(20) **Xiongjie Zheng**., Mi, J., Balakrishna, A., Liew, K. X., Ablazov, A., Sougrat, R., & Al-Babili, S. (2022). Gardenia carotenoid cleavage dioxygenase 4a is an efficient tool for biotechnological production of crocins in green and non-green plant tissues. ***Plant Biotechnology Journal***. 20 (11), 2202-2216.

(19) Yang, Y., Abuauf, H. W., Song, S., Wang, J. Y., Alagoz, Y., Moreno, J. C.,…**Xiongjie Zheng**..... & Al-Babili, S. (2022). The Arabidopsis D27‐LIKE1 is a *cis*/*cis*/*trans*-β-carotene Isomerase that Contributes to Strigolactone Biosynthesis and Negatively Impacts Abscisic Acid Level. ***The Plant Journal***. 113(5), 986-1003.

(18) Jianing Mi, Juan C Moreno, Yagiz Alagoz, Kit Xi Liew, Aparna Balakrishna, **Xiongjie Zheng**, Salim Al-Babili. (2022) Ultra-high performance liquid chromatography-mass spectrometry analysis of plant apocarotenoids. ***Methods in Enzymology***, vol. 670, pp. 285-309

(17) Kaijie Zhu, Hongyan Chen, Yingzi Zhang, Yun Liu, **Xiongjie Zheng** et al., (2022) Carotenoid extraction, detection, and analysis in citrus. ***Methods in Enzymology***. pp. 179

(16) **Xiongjie Zheng**, Hendrik N.J. Kuijer, Salim Al-Babili. (2021) Carotenoid Biofortification of Crops in the CRISPR Era. ***Trends in Biotechnology***. 39，9, 857-860.

(15) **Xiongjie Zheng**, Jianing Mi, Xiuxin Deng, Salim Al-Babili. (2021) LC-MS-based profiling provides new insights into apocarotenoid biosynthesis and modifications in citrus fruit. ***Journal of Agricultural and Food Chemistry***. 69, 6, 1842–1851.

(14) **Xiongjie Zheng**, Yu Yang, and Salim Al-Babili (2021). Exploring the Diversity and Regulation of Apocarotenoid Metabolic Pathways in Plants. ***Frontiers in plant science***. *12*, p.787049.

(13) Kaijie Zhu, **Xiongjie Zheng**, Junli Ye, Yue Huang, et al., (2021) Regulation of carotenoid and chlorophyll pools in hesperidia, anatomically unique fruits found only in Citrus. ***Plant Physiology.*** 187, 2, 829-845.

(12) Xiaomei Tang, Shulin Chen, Huiwen Yu, **Xiongjie Zheng**, et al., (2021) Development of a gRNA–tRNA array of CRISPR/Cas9 in combination with grafting technique to improve gene-editing efficiency of sweet orange. ***Plant Cell Reports.*** 40, 12, 2453-2456.

(11) Quan Sun, Yizhong He, Junli Ye, **Xiongjie Zheng**, Cong Zhou, et al., (2021) Storage with apple fruit to improve peel color and maintain freshness of Newhall navel

orange. ***Scientia Horticulturae.*** 287, 110246

(10) **Xiongjie Zheng**, Giovanni Giuliano, Salim Al-Babili. (2020) Carotenoid biofortification in crop plants: *citius*, *altius*, *fortius*. ***Biochimica et Biophysica Acta (BBA)-Molecular and Cell Biology of Lipids***. 1865(11), 158664.

(9) **Xiongjie Zheng** *, Kaijie Zhu*, Junli Ye, Elliott J. Price, Xiuxin Deng, and Paul D. Fraser. (2020) The effect of β-cyclocitral treatment on the carotenoid content of transgenic Marsh grapefruit (*Citrus paradisi* Macf.) suspension-cultured cells. ***Phytochemistry*** 180: 112509.

(8) Zhu, Kaijie, **Xiongjie Zheng**, Junli Ye, Qihang Jiang, Hongyan Chen, Xuehan Mei, Eleanore T. Wurtzel, and Xiuxin Deng. (2020) Building the Synthetic Biology Toolbox with Enzyme Variants to Expand Opportunities for Biofortification of Provitamin A and Other Health-Promoting Carotenoids. ***Journal of Agricultural and Food Chemistry.*** 68, 43: 12048-12057.

(7) **Xiongjie Zheng**, Kaijie Zhu, Quan Sun, Weiyi Zhang, Xia Wang, Hongbo Cao, Meilian Tan, Zongzhou Xie, Yunliu Zeng, Junli Ye, Lijun Chai, Qiang Xu1, Zhiyong Pan, Shunyuan Xiao, Paul D. Fraser, Xiuxin Deng. (2019) Natural Variation in CCD4 Promoter Underpins Species-specific Evolution of Red Coloration in Citrus Peel. ***Molecular Plant.*** 12, 1294-1307.

(6) Chenqiao Zhu*, **Xiongjie Zheng*(*co-first author)**, Yue Huang*, Junli Ye, Peng Chen, Chenglei Zhang, Fei Zhao, Zongzhou Xie, Siqi Zhang, Nan Wang, Hang Li, Lun Wang, Xiaomei Tang, Lijun Chai, Qiang Xu, and Xiuxin Deng. (2019) Genome Sequence and CRISPR Editing of a Fast-Flowering Mini Citrus (*Fortunella hindsii*). ***Plant Biotechnology Journal***, 17(11), pp.2199-2210.

(5) **Xiongjie Zheng**, Yuqing Tang, Junli Ye, Zhiyong Pan, Meilian Tan, Zongzhou Xie, Lijun Chai, Qiang Xu, Paul D. Fraser, Xiuxin Deng. (2019) SLAF-based construction of a high-density genetic map and its application in QTL mapping of carotenoids content in citrus fruit. ***Journal of Agricultural and Food Chemistry.*** 67, 994-1002.

(4) Zhang, Yingzi, Yun Liu, Fengxia Liu, **Xiongjie Zheng**, Zongzhou Xie, Junli Ye, Yunjiang Cheng, Xiuxin Deng, and Yunliu Zeng. (2019) Investigation of chromoplast ultrastructure and tissue-specific accumulation of carotenoids in citrus flesh. ***Scientia Horticulturae*** 256: 108547.

(3) Lu, Suwen, Yin Zhang, **Xiongjie Zheng**, Kaijie Zhu, Qiang Xu, and Xiuxin Deng. (2016) "Molecular characterization, critical amino acid identification, and promoter analysis of a lycopene β-cyclase gene from citrus. ***Tree Genetics & Genomes*** 12, 6: 1-12.

(2) Lu, Suwen, Yin Zhang, **Xiongjie Zheng**, Kaijie Zhu, Qiang Xu, and Xiuxin Deng. (2016) Isolation and functional characterization of a lycopene β-cyclase gene promoter from citrus. ***Frontiers in plant science*** 7: 1367.

(1) Xiongjie Zheng*, Zongzhou Xie*, Kaijie Zhu, Qiang Xu, Xiuxin Deng, Zhiyong Pan. (2015) Isolation and characterization of carotenoid cleavage dioxygenase 4 genes from different citrus species. ***Molecular Genetics and Genomics.*** 290(4): 1589-1603.

Patents

(1) **Xiongjie Zheng**, Xiuxin Deng, Zhengchen He, Junli Ye, Lijun Chai, Zongzhou Xie. Method for isolating and purifying Rubixanthin from the fruit peel of *Fortunella hindsii*, a wild citrus species with a short juvenile phase. (No. CN119613309A, Status: Granted).

(2) Xiuxin Deng, **Xiongjie Zheng**, Quan Sun, Zongzhou Xie, Qiang Xu, Lijun Chai. The DNA sequences associated with red/yellow color trait of citrus peel and application of in breeding. (No. CN107488659B, Status: Granted, 2019-12).

(3) Xiuxin Deng, **Xiongjie Zheng**, Kaijie Zhu, Yuqing Tang, Junli Ye, Hongbo Cao. Multiple-gene engineering in citrus cell culture produces β-citraurinene and its potential application. (No. CN108441480B, Status: Granted, 2020-06).

Awards

Hubei "High-level Overseas Talent Recruitment Program–Innovative Talent"

China Scholarship Council (CSC) Visiting PhD student Fellowship

Invited Presentation

2018 Oral and poster presentation
June 16-17
Gordon Research Seminar on Carotenoids (GRS), Newry, ME, USA
Title: The biochemical and molecular genetic mechanism underlying aesthetic red color trait in citrus fruit.

2018 Poster presentation
June 17-22
Carotenoids, Apocarotenoids and Retinoids: From Nature to Bedside, Gordon Research Conference (GRC), Newry, ME, USA
Title: The biochemical and molecular genetic mechanism underlying

aesthetic red color trait in citrus fruit.

2023 Oral and poster presentation
Jan 7-8
Gordon Research Seminar on Carotenoids (GRS), Ventura, CA, USA.
Title: Installing the Neurospora carotenoid pathway in plants: Cytosolic provitamin A formation and sequestration.

2023 Poster presentation
Jan 8-13
Gordon Research Conference on Carotenoids (GRC), Ventura, CA, USA.
Title: Installing the Neurospora carotenoid pathway in plants: Cytosolic provitamin A formation and sequestration.

Professional contributions

Associate guest editor (2022-2023) of *Frontiers in Plant Science*.

Invited Reviewer for *Journal of Experimental Botany*, *Plant Comunications*, *ACS Synthetic Biology*, *Plant Science*, *Plant Cell Report*, *Scientia Horticulturae*, *Plant Physiology and Biochemistry*.