



# 中国农业科学院农业资源与农业区划研究所

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## 吴庆钰

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### 工作经历

2019 – 至今中国农业科学院农业资源与农业区划研究所，研究员，博导

2012 – 2018美国冷泉港实验室，博士后

### 教育经历

2008 – 2012 美国堪萨斯州立大学，博士

2005 – 2008 中国农业科学院农业资源与农业区划研究所，硕士

2001 – 2005 东北农业大学生命科学学院，学士

### 研究方向和成果

课题组主要研究方向是围绕植物营养元素吸收、玉米遗传学及植物干细胞发育这三个相对独立又紧密关联的方向开展研究，最终的目标是培育养分高效、高产的作物。主要研究内容是利用分子遗传学、生物化学、细胞生物学、基因组学及基因编辑等技术解析作物花序形态建成及矿质元素高效利用的分子机制，深入研究细胞间信号通讯对农作物发育、环境应答及产量性状调控的分子机理，并通过调控作物发育与环境应答的共用信号开关分子—G蛋白来优化玉米雌穗发育从而提高作物产量。研究成果在《PNAS》，《Trends in Plant Science》等国际刊物上发表论文30余篇，被引用1000余次，H指数为18。

**实验室主页：** <https://wuqingyu.wixsite.com/maize>

### 科研项目

2022– 2025 “玉米G蛋白调控花序发育与自主免疫的机制研究”，国家自然科学基金面上项目（32171925），主持；

2021– 2025 中国农业科学院创新工程青年英才院级启动经费(G202114-5)，主持

2019 – 2020 “作物农艺性状调控回路设计（2019ZX08010-004）”，国家科技重大专项——转基因生物新品种培育，参与；

2019 – 2020 中国农业科学院创新工程青年英才所级启动经费（954-2），主持；

2017 – 2019 “番茄Ca<sup>2+</sup>/H<sup>+</sup>转运蛋白对钙离子分配与转运的调控机制及对生理失调的影响 (31601822) ” , 国家自然科学基金青年项目, 主持。

### 主要奖励荣誉

2019 中国农业科学院农业资源与农业区划研究所科技标兵

2019 中国农业科学院青年英才计划

2015 Keystone Symposia Plant Receptor Kinase会议奖学金

### 代表性论文

# 通讯作者, \* 共同第一作者

#### 2022

31. Li S\*, Ment S\*, Weng J\*, **Wu Q**#. 2021 Fine-tuning shoot meristem size to feed the world. **Trends in Plant Science (In Press)** .

#### 2021

30. Kakeshpour T, Tamang TM, Motolai G, Fleming ZW, Pakr J, **Wu Q**, Park S#. 2021 CGFS-type glutaredoxin mutations reduce tolerance to multiple abiotic stresses in tomato. **Physiologia Plantarum 173(3)**:1263-1279.

29. Nie S\*, Wang B\*, Ding H\*, Lin H\*, Zhang L\*, Li Q\*.... **Wu Q**#, Xu F#, Zhang Z#. 2021 Genome assembly of the Chinese maize elite inbred line RP125 and its EMS mutant collection provide new resources for maize genetics research and crop improvement. **Plant Journal 108(1)**: 40-54.

28. Liu L, Gallagher J, Demesa Arevalo E, Chen R, Skopelitis T, **Wu Q**, Bartlett M, Jackson D. 2021 Enhancing grain-yield-related traits by CRISPR–Cas9 promoter editing of maize CLE genes. **Nature Plants 7**: 287-294.

27. 薛琴琴, 韩贝贝, 吴雪晴, 李沛, 李莹莹, **吴庆钰**#. 2021 纳米材料在农作物领域的应用及展望. *生物技术进展* 10(6): 655-660.

#### 2020

26. **Wu Q**\*, Xu F\*, Liu L, Char SN, Ding Y, Schmelz EA, Yang B, Jackson D. 2020 The maize heterotrimeric G-protein b subunit controls shoot meristem development and immune response. **PNAS 117**: 1799-1805.

25. Huang S, Xin S, Xie G, Han J, Liu Z, Wang B, Zhang S, **Wu Q**, Cheng X. 2020 Mutagenesis reveals that the rice OsMPT3 gene is an important osmotic regulatory factor. **The Crop Journal 8(3)**:465-479.

24. Guo Z, Ruan W, **Wu Q**, Lyu Y, Yi K. 2020 Vacuolar phosphate transporters account for variation in phosphate accumulation in *Astragalus sinicus* cultivars. **The Crop Journal 9(1)**: 227-237.

23. Kim S, Karre S, **Wu Q**, Park M, Meyers E, Claeys H, Wisser R, Jackson D, Balint-Kurti P. 2020 Multiple insertions of COIN, a novel maize Foldback transposable element, in the Conring gene cause a spontaneous progressive cell death phenotype. **Plant Journal 104(3)**: 581-595

#### 2019

22. Kang BC\*, **Wu Q**\*, Sprague S, Park S, White F, Bae S, Han J. 2019 Ectopic Overexpression of an Arabidopsis Monothiol Glutaredoxin AtGRXS17 Affects Floral Development and Improves Response to Heat Stress in Chrysanthemum (*Chrysanthemum morifolium* Ramat.). **Environmental and Experimental Botany 167**:103864.

#### 2018

21. **Wu Q\***, Xu F\*, Jackson D. 2018 All together now, a magical mystery tour of the maize shoot meristem. **Current Opinion in Plant Biology** **45**:26-35

20. **Wu Q**, Regan M, Furukawa H, Jackson D. 2018 Role of heterotrimeric Gα proteins in maize development and enhancement of agronomic traits. **PLoS Genetics****14(4)**: e1007374

19. **Wu Q**, Jackson D. (2018) Detection of MAPK3/6 phosphorylation during hypersensitive response (HR)-associated programmed cell death in plants. **Methods in Molecular Biology** **1743**: 153-161

18. Je B, Xu F, **Wu Q**, Liu L, Meeley R, Jackson D. (2018) The CLAVATA receptor FASCIATED EAR2 responds to different CLE peptides by signaling through different downstream effectors. **Elife** **7**:e35673

## 2017

17. **Wu Q#**, Yang J, Cheng NH, Hirschi KD, White FF, Park SH#. (2017) Glutaredoxins in plant development, abiotic stress response, and iron homeostasis: from model organisms to crops. **Environmental and Experimental Botany****139**:91-98

16. Jiang HM\*, Zhang JF\*, Han Z\*, Yang JC, Ge CL#, **Wu Q#**. (2017) Revealing new insights into different phosphorus-starving responses between two maize ( *Zea mays* ) inbred lines by transcriptomic and proteomic studies. **Scientific Reports** **7**:44294

15. **Wu Q**, Park S, Kirkham MB, Williams K. (2017) Transcriptome analysis reveals potential mechanisms for inhibition of intumescence development by UV radiation in tomato. **Environmental and Experimental Botany** **134**:130-140

14. **Wu Q**, Hu Y, Sprague S, Kakeshpour T, Park J, Nakata PA, Cheng NH, Hirschi KD, White FF, Park S. 2017 Expression of a monothiol glutaredoxin, AtGRXS17 , in tomato ( *Solanum lycopersicum* ) enhances drought tolerance. **Biochemical and Biophysical Research Communications** **491**: 1034-1039

13. Hu Y, **Wu Q**, Peng Z, Sprague S, Wang W, Park J, Akhunov E, Jagadish K, Nakata P, Cheng NH, Hirschi K, White F. (2017) Silencing of OsGRXS17 in rice improves drought stress tolerance by modulating ROS accumulation and promoting ABA-mediated stomatal closure. **Scientific Reports** **7**:15950

## 2016

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10. Urano D, Miura K, **Wu Q**, Iwasaki Y, Jackson D, Jones A. (2016) Morphology of plant G protein mutants. **Plant and Cell Physiology** **57**:437-445

## 2015

9. Ying H\*, **Wu Q\***, Sprague S, Park J, Oh M, Rajashekar CB, Koiwa H, Nakata P, Cheng NH, Hirschi KD, White FF, Park S. (2015) Ectopic expression of Arabidopsis glutaredoxin gene AtGRXS17 in tomato confers tolerance to chilling stress. **Horticulture Research** **2**: 15051(**Featured article**)

## 2014

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## 2013

7. **Wu Q**, Luo A, Zadrozny T, Sylvester A, Jackson D. (2013) Fluorescent protein marker lines in maize: generation and applications. **International Journal of Developmental Biology** 57: 535-543.

## 2012

6. **Wu Q**, Lin J, Liu JZ, Wang XF, Lim W, Oh M, Park J, Rajashekar CB, Whitham SA, Cheng NH, Hirschi KD, Park S. (2012) Ectopic expression of Arabidopsis glutaredoxin AtGRXS17 enhances thermotolerance in tomato (*Lycopersicon esculentum*). **Plant Biotechnology Journal** 10: 945-955.

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4. Freitas ST, Handa AK, **Wu Q**, Park S, Mitcham EJ. (2012) Role of pectin methylesterases on cellular calcium distribution and blossom-end rot development in tomato fruit. **Plant Journal** 71: 824-835.

## 2011

3. **Wu Q**, Shigaki T, Han JS, Kim CK, Hirschi KD, Park SH. (2011) Expression of an Arabidopsis Ca<sup>2+</sup>/H<sup>+</sup> antiporter CAX1 variant in petunia enhances cadmium tolerance and accumulation. **Journal of Plant Physiology** 168: 167-173.

2. Cheng NH, Liu JZ, Liu X, **Wu Q**, Thompson SM, Lin J, Chang J, Whitham SA, Park S, Cohen JD, Hirschi KD. (2011) Arabidopsis Monothiolglutaredoxin, AtGRXS17, is critical for temperature-dependent postembryonic growth and development via modulating auxin response. **Journal of Biological Chemistry** 286:20398-20406.

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## 编著

1. Park JK, Park SH, **Wu Q**, Sprague S. (2012) Agrobacterium-Mediated Transformation of Plants. **Plant Tissue Culture**, 3rd Edition: Ed. R.H. Smith, Academic Press. Chapter 14: 155-166.

## 联系方式

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