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# Curriculum Vitae

## Personal Data

**Name:** Lizhong Xiong

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**Institution:** National Key Laboratory of Crop Genetic Improvement and National Center of Plant Gene Research (Wuhan), Huazhong Agricultural University.

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## Education

9, 1990 - 6, 1994 Bachelor degree, Plant Breeding, Huazhong Agricultural University, China.

9, 1994 - 7, 1999 Ph. D. degree, Molecular Biology, Huazhong Agricultural University, China.

## Position Held

9, 2002 – Professor, Huazhong Agricultural University.

9, 1999 – 9, 2002 Postdoctoral fellowship, University of Arkansas.

## Current Research Interests

Research field: Functional genomics and abiotic stress biology of rice

Current research activities:

- Integrated forward and reverse genetics approaches to discover and characterize novel genes /mechanisms for stress resistance of rice with focus on drought resistance.
- High thought phenotyping technologies in rice.
- Improving drought resistance and /or water use efficiency of rice at reproductive stage by combination of biotechnology and conventional breeding.

## Honors and Rewards

Second Prize of Hubei Award for Technological Invention, 2019

“Ten Thousand Plan” National High Level Talents Special Support Plan, 2018

Science and Technology Ministry of Youth Science and Technology Innovation Leader, 2016

Yangtze River Scholars Distinguished Professor, 2015

National BaiQianWan Talents Program, 2014

Second Prize of National Award for Technological Invention, 2013

First Prize of Hubei Natural Science Awards, 2013

Agriculture Ministry of Agricultural Research Outstanding Talents, 2012

National Outstanding Scientific and Technological Workers, 2012

First Prize of Shanghai Science and Technology Awards, 2013

China Youth Science and Technology Innovation Award, 2007

China National Funds for Distinguished Young Scientists, 2007

Hubei “May Fourth” Youth Medal, 2007

New Century Excellent Talents in University, 2004

## Membership in Academic Societies

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Member of International Committee of InterDrought Conference  
Member of Chinese Society of Biochemistry and Molecular Biology  
Member of Genetics Society of Hubei Province  
Editor of Theoretical and Applied Genetics  
Editor of Molecular Genetics and Genomics

### **Published Papers in Recent Five Years (\*corresponding author):**

#### **2020:**

1. Guo Z#, Liu X#, Zhang B, Yuan X, Xing Y, Liu H, Luo L, Chen G\*, Xiong L\*(2020) Genetic analyses of lodging resistance and yield provide insights into post-Green-Revolution breeding in rice. *Plant Biotechnol J*, 2020 Nov 7. doi: 10.1111/pbi.13509. Online ahead of print.
2. Xu Y#, Hu D#, Hou X, Shen J, Liu J, Cen X, Fu J, Li X, Hu H, **Xiong L\***(2020). OsTMF attenuates cold tolerance by affecting cell wall properties in rice. *New Phytol*. Mar 16. doi: 10.1111/nph.16549.
3. Yang J#, Chang Y#, Qin Y, Chen D, Zhu T, Peng K, Wang H, Tang N, Li X, Wang Y, Liu Y, Li X, Xie W, **Xiong L\***(2020). A lamin-like protein OsNMCP1 regulates drought resistance and root growth through chromatin accessibility modulation by interacting with a chromatin remodeller OsSWI3C in rice. *New Phytol*. 227(1): 65-83.
4. Zong W#, Yang J#, Fu J, **Xiong L\***(2020). Synergistic regulation of drought-responsive genes by transcription factor OsbZIP23 and histone modification in rice, *Journal of Integrative Plant Biology*, 62(6):723-729.

#### **2019:**

5. Ma S, Tang N\*, Li X, Xie Y, Xiang D, Fu J, Shen J, Yang J, Tu H, Li X, Hu H, **Xiong L\***(2019), Reversible histone H2B monoubiquitination fine-tunes abscisic acid signaling and drought response in rice. *Molecular Plant*. 12(2):263-277.
6. Li X#, Chang Y#, Ma S, Shen J, Hu H, **Xiong L\***(2019). Genome-Wide Identification of SNAC1-Targeted Genes Involved in Drought Response in Rice. *Front Plant Sci*. 2019 Jul 26;10:982. doi: 10.3389/fpls.2019.00982. eCollection 2019.

#### **2018:**

7. Guo Z, Yang W\*, Chang Y, Ma X, Tu H, Xiong F, Jiang N, Feng H, Huang C, Yang P, Zhao H, Chen G, Liu H, Luo L, Hu H, Liu Q, **Xiong L\***(2018), Genome-wide association studies of image traits reveal the genetic architecture of drought resistance in rice, *Molecular Plant*. 11(6):789-805.
8. Du H, Huang F, Wu N, Li X, Hu H, **Xiong L\***(2018). Integrative regulation of drought escape through ABA dependent and independent pathways in Rice. *Molecular Plant*. 11(4):584-597.

#### **2017:**

9. Shen J, Liu J, Xie K, Xing F, Xiong F, Xiao J, Li X, **Xiong L\***(2017), Translational repression by a miniature inverted-repeat transposable element in the 3' untranslated region. *Nature Communications*, 8:14651. DOI: 10.1038/ncomms14651.
10. Li X, Guo Z, Lv Y, Cen X, Ding X, Wu H, Li X, Huang J, **Xiong L\***(2017), Genetic control of the root system in rice under normal and drought stress conditions by genome-wide association study. *PLoS Genet.*, 7;13(7):e1006889. doi: 10.1371/journal.pgen.1006889.
11. Lv Y, Yang M, Hu D, Yang Z, Ma S, Li X, **Xiong L\***(2017) The OsMYB30 Transcription Factor Suppresses Cold Tolerance by Interacting with a JAZ Protein and Suppressing  $\beta$ -Amylase Expression. *Plant Physiology*. 173:1475-1491.

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12. Chang Y#, Nguyen BH#, Xie Y, Xiao B, Tang N, Zhu W, Mou T\*, **Xiong L\***(2017) Co-overexpression of the constitutively active form of OsbZIP46 and ABA-activated protein kinase SAPK6 improves drought and temperature stress resistance in rice. *Front Plant Sci*, <https://doi.org/10.3389/fpls.2017.01102>.
  13. Fu J, Wu H, Ma S, Xiang D, Liu R, **Xiong L\***(2017). OsJAZ1 Attenuates Drought Resistance by Regulating JA and ABA Signaling in Rice. *Front Plant Sci*, <https://doi.org/10.3389/fpls.2017.02108>.
  14. Feng H, Guo Z, Yang W, Huang C, Chen G, Fang W, Xiong X, Zhang H, Wang G, **Xiong L\***, Liu Q\*(2017) An integrated hyperspectral imaging and genome-wide association analysis platform provides spectral and genetic insights into the natural variation in rice. *Scientific Reports*, 2017 Jun 30;7(1):4401. doi: 10.1038/s41598-017-04668-8.

#### **2016:**

15. Tang N , Ma S, Zong W, Yang N, Lv Y, Yan C, Guo Z, Li J, Li X, Xiang Y, Song H, Xiao J, Li X, **Xiong L\***(2016). MODD mediates deactivation and degradation of OsbZIP46 to negatively regulate ABA signaling and drought resistance in rice. *Plant Cell*. 28: 2161-2177.
16. Liu J, Shen J, Xu Y, Li X, Xiao J, **Xiong L\***(2016). Ghd2, a CONSTANS-like gene, confers drought sensitivity through regulation of senescence in rice. *Journal of Experimental Botany*. 67(19): 5785-5798.
17. Zong W, Tang N, Yang J, Peng L, Ma S, Xu Y, Li G, **Xiong L\***(2016). Feedback regulation of ABA signaling and biosynthesis by a bZIP transcription factor targets drought-resistance-related genes. *Plant Physiology*. 171:2810-2825.

#### **2015:**

18. Xu Y, Zong W, Hou X, Yao J, Liu H, Li X, Zhao Y\*, **Xiong L\***(2015). OsARID3, an AT-rich Interaction Domain-containing protein, is required for shoot meristem development in rice. *Plant J*. 83:806-817 .
19. Yang W, Guo Z, Huang C, Wang K, Jiang N, Feng H, Chen G, Liu Q, **Xiong L\***(2015). Genome-wide association study of rice (*Oryza sativa* L.) leaf traits with a high-throughput leaf scorer. *J Exp Bot*. 66(18):5605-5615.
20. Fang Y, Liao K, Du H, Xu Y, Song H, Li X, **Xiong L\***(2015). A stress-responsive NAC transcription factor SNAC3 confers heat and drought tolerance through modulation of reactive oxygen species in rice. *Journal of Experimental Botany*. 66(21): 6803-6817.
21. Lv Y, Guo Z, Li X, Ye H, Li X, **Xiong L\***(2015). New insights into the genetic basis of natural chilling and cold shock tolerance in rice by genome-wide association analysis. *Plant Cell and Environment*. 39(3):556-570.
22. Fang Y, **Xiong L\***(2015). General mechanisms of drought response and their application in drought resistance improvement in plants. *Cellular and Molecular Life Sciences*. 72(4): 673-689.
23. Wu H, Ye H, Yao R, Zhang T, **Xiong L\***(2015). OsJAZ9 acts as a transcriptional regulator in jasmonate signaling and modulates salt stress tolerance in rice. *Plant Science*. 232: 1-12 .

#### **2014:**

24. Yang W, Guo Z, Huang C, Duan L, Chen G, Jiang N, Fang W, Feng H, Xie W, Lian X, Wang G, Luo Q, Zhang Q, Liu Q\*, **Xiong L\***(2014). Combining high-throughput phenotyping and genome-wide association studies to reveal natural genetic variation in rice. *Nature Communications*. 8(5):5087.
25. Songyikhansuthor K, Guo Z, Wang N, Zhu X, Xie W, Mou T, **Xiong L\***(2014). Natural Variation in the Sequence of SNAC1 and Its Expression Level Polymorphism in Rice

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Germplasms under Drought Stress. *Journal of Genetics and Genomics*. 41(11): 609-612.

26. Du H, Wu N, Cui F, You L, Li X, **Xiong L\***(2014). A homolog of ETHYLENE OVERPRODUCER, OsETOL1, differentially modulates drought and submergence tolerance in rice. *Plant Journal*. 78(5): 834-849.
27. You J, Zong W, Hu H, Li X, Xiao J, **Xiong L\***(2014). A SNAC1-regulated protein phosphatase gene OsPP18 modulates drought and oxidative stress tolerance through ABA-independent reactive oxygen species scavenging in rice. *Plant Physiology*. 166(4): 2100-2114.
28. Hu H, **Xiong L\***(2014). Genetic Engineering and Breeding of Drought-Resistant Crops. *Annual Review Plant Biology*. 65:715-741.
29. Fang Y, Xie K, **Xiong L\***(2014). Conserved miR164-targeted NAC genes negatively regulate drought resistance in rice. *Journal of Experimental Botany*. Mar 6.
30. You J, Zong W, Du H, Hu H, **Xiong L\***(2014). A special member of the rice SRO family, OsSRO1c, mediates responses to multiple abiotic stresses through interaction with various transcription factors. *Plant Molecular Biology*. 84(6):693-705.

### **2013:**

31. Zhu X, **Xiong L\***(2013). Putative megaenzyme DWA1 plays essential roles in drought resistance by regulating stress-induced wax deposition in rice. *Proceedings of the National Academy of Sciences of United States of America*. 110(44): 17790-17795.
32. Du H, Liu H and **Xiong L\***(2013). Endogenous auxin and jasmonic acid levels are differentially modulated by abiotic stresses in rice. *Frontiers in Plant Science*. 4:397.
33. Qi Z, **Xiong L\***(2013). Characterization of a purine permease family gene OsPUP7 involved in growth and development control in rice. *Journal of Integrative Plant Biology*. Aug 27.
34. Du H, Wu N, Chang Y, Li X, Xiao J, **Xiong L\***(2013). Carotenoid deficiency impairs ABA and IAA biosynthesis and differentially affects drought and cold tolerance in rice. *Plant Molecular Biology*. 83(4-5):475-488.
35. Yang W, Duan L, Chen G, **Xiong L\***, Liu Q\*(2013). Plant phenomics and high-throughput phenotyping: accelerating rice functional genomics using multidisciplinary technologies. *Current Opinion in Plant Biology*. 16(2):180-187.
36. Fukao T\*, **Xiong L\***(2013). Genetic mechanisms conferring adaptation to submergence and drought in rice: simple or complex? *Current Opinion in Plant Biology*. 16(2):196-204.
37. Ding X, Li X, **Xiong L\***(2013). Insight into differential responses of upland and paddy rice to drought stress by comparative expression profiling analysis. *International Journal of Molecular Sciences*. 14(3):5214-38.
38. Zong W, Zhong X, You J, **Xiong L\***(2013). Genome-wide profiling of histone H3K4-trimethylation and gene expression in rice under drought stress. *Plant Molecular Biology*. 81:175-88.
39. You J, Zong W, Li X, Ning J, Hu H, Li X, Xiao J, **Xiong L\***(2013). The SNAC1-targeted gene OsSRO1c modulates stomatal closure and oxidative stress tolerance by regulating hydrogen peroxide in rice. *Journal of Experimental Botany*. 64(2):569-83.

### **2012:**

40. Du H, Wu N, Fu J, Wang S, Li X, Xiao J, **Xiong L\***(2012). A GH3 family member, OsGH3-2, modulates auxin and abscisic acid levels and differentially affects drought and cold tolerance in rice. *Journal of Experimental Botany*. 63(18): 6467-6480.
41. You J, Hu H, **Xiong L\***(2012). An ornithine  $\delta$ -aminotransferase gene OsOAT confers drought and oxidative stress tolerance in rice. *Plant Science*. 197:59-69.
42. Xie K, Shen J, Hou X, Yao J, Li X, **Xiong L\***(2012). Gradual increase of miR156 regulates temporal expression changes of numerous genes during leaf development in rice. *Plant*

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Physiology. 158(3):1382-1394.

43. Tang N, Zhang H, Li X, Xiao J, **Xiong L\***(2012). Constitutive Activation of Transcription Factor OsZIP46 Improves Drought Tolerance in Rice. *Plant Physiology*. 158(4):1755-1768.

**2011:**

44. Ning J, Zhang B, Wang N, Zhou Y, **Xiong L\***(2011) Increased Leaf Angle1 (ILA1), A Raf-Like MAPKKK That Interacts with a Nuclear Protein Family, Regulates Mechanical Tissue Formation in the Lamina Joint of Rice. *Plant Cell*. 23: 4334-4347.
45. Du H, Liu L, You L, Yang M, He Y, Li X, **Xiong L\***(2011) Characterization of an inositol 1,3,4-trisphosphate 5/6-kinase gene that is essential for drought and salt stress responses in rice. *Plant Molecular Biology*. 77(6): 547-563.
46. Wang N, Xiao B, **Xiong L\***(2011) Identification of a cluster of PR4-like genes involved in stress responses in rice. *Journal of Plant Physiology*. 168(18):2212-24.
47. Ding X, Li X, **Xiong L\***(2011) Evaluation of near-isogenic lines for drought resistance QTL and fine mapping of a locus affecting flag leaf width, spikelet number, and root volume in rice. *Theoretical and Applied Genetics*. 123(5):815-26.
48. Zhou G, Liu F, Cao J, Yue B, **Xiong L\***(2011) Detecting quantitative trait loci for water use efficiency in rice using a recombinant inbred line population. *Chinese Science Bulletin*. 56 (14): 1481-1487.
49. Chen Q, Wang Q, **Xiong L\***, Lou Z\*(2011) A structural view of the conserved domain of rice stress-responsive NAC1. *Protein Cell*. 2: 55-63.

**2010:**

50. Du H, Wang N, Cui F, Li X, Xiao J, **Xiong L\***(2010) Characterization of the  $\beta$ -Carotene Hydroxylase Gene DSM2 Conferring Drought and Oxidative Stress Resistance by Increasing Xanthophylls and Abscisic Acid Synthesis in Rice. *Plant Physiology*. 154:1304-1318.
51. Shen J, Xie K, **Xiong L\***(2010) Global expression profiling of rice microRNAs by one-tube stem-loop reverse transcription quantitative PCR revealed important roles of microRNAs in abiotic stress responses. *Molecular Genetics and Genomics*. 284:477-488.
52. Ning J, Li X, Hicks LM, **Xiong L\***(2010) A Raf-Like MAPKKK Gene DSM1 Mediates Drought Resistance through Reactive Oxygen Species Scavenging in Rice. *Plant Physiology*. 152: 876-890.
53. Fang Y, Xie K, Hou X, Hu H, **Xiong L\***(2010) Systematic analysis of GT factor family of rice reveals a novel subfamily involved in stress responses. *Molecular Genetics and Genomics*. 283:157-169.
54. Liu J, Liang D, Song Y, **Xiong L\***(2010) Systematic identification and expression analysis of BREVIS RADIX homologous genes in rice. *Plant Science*. 178: 183-191.

**2009:**

55. Qin Y, Ye H, Tang N, **Xiong L\***(2009) Systematic identification of X1-homologous genes reveals a family involved in stress responses in rice. *Plant Molecular Biology*. 71(4-5):483-496.
56. Ye H, Du H, Tang N, Li X, **Xiong L\***(2009) Identification and expression profiling analysis of TIFY family genes involved in stress and phytohormone responses in rice. *Plant Molecular Biology*. 71(3):291-305.
57. Islam MA, Du H, Ning J, Ye H, **Xiong L\***(2009) Characterization of Glossyl-homologous genes in rice involved in leaf wax accumulation and drought resistance. *Plant Molecular Biology*. 70:443-456.
58. Song Y, You J, **Xiong L\***(2009) Characterization of OsIAA1 gene, a member of rice

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Aux/IAA family involved in auxin and brassinosteroid hormone responses and plant morphogenesis. *Plant Molecular Biology*. 70:297-309.

59. Ding X, Hou X, Xie K, **Xiong L\***(2009) Genome-wide identification of BURP domain-containing genes in rice reveals a gene family with diverse structures and responses to abiotic stresses. *Planta*. 230:149-163.
60. Hou X, Xie K, Yao J, Qi Z, **Xiong L\***(2009) A homolog of human ski-interacting protein in rice positively regulates cell viability and stress tolerance. *Proceedings of the National Academy of Sciences of United States of America*. 106:6410-6415.
61. Xiao B, Chen X, Xiang C, Tang N, Zhang Q, **Xiong L\***(2009) Evaluation of seven function-known candidate genes for their effects on improving drought resistance of transgenic rice under the field conditions. *Molecular Plant*. 2: 73-83.

**2008:**

62. Xiang Y, Tang N, Du H, Ye H, **Xiong L\***(2008) Characterization of OsbZIP23 as a key player of bZIP transcription factor family for conferring ABA sensitivity and salinity and drought tolerance in rice. *Plant Physiology*. 148(4): 1938-1952.
63. Hu H, You J, Fang Y, Zhu X, Qi Z, **Xiong L\***(2008) Characterization of transcription factor gene SNAC2 conferring cold and salt tolerance in rice. *Plant Molecular Biology*. 67:169-81.
64. Fang Y, You J, Xie K, Xie W, **Xiong L\***(2008) Systematic sequence analysis and identification of tissue-specific or stress-responsive genes of NAC transcription factor family in rice. *Molecular Genetics and Genomics*. 280(6):547-563.
65. Ning J, Liu S, Hu H, **Xiong L\***(2008) Systematic analysis of NPK1-like genes in rice reveals a stress-inducible gene cluster co-localized with a quantitative trait locus of drought resistance. *Molecular Genetics and Genomics*. 280(6):535-46.
66. Nayidu NK, Wang L, Xie W, Zhang C, Fan C, Lian X, Zhang Q, **Xiong L\***(2008) Comprehensive Sequence and Expression Profile Analysis of PEX11 Gene Family in Rice. *Gene*. 412:59-70.

**2007:**

67. Xiang Y, Huang Y, **Xiong L\***(2007) Characterization of stress-responsive CBL-Interacting protein kinase (CIPK) genes in rice for stress tolerance improvement. *Plant Physiology*. 144: 1416-1428.
68. Xiao B, Huang Y, Tang N, **Xiong L\***(2007) Overexpression of a LEA gene by different promoters in rice improved drought resistance under the field conditions. *Theoretical and Applied Genetics*. 115: 35-46.
69. Huang Y, Xiao B, **Xiong L\***(2007) Overexpression of a stress responsive proteinase inhibitor gene improves drought resistance of rice. *Planta*. 226:73-85.

**2006:**

70. Wu C, Hu H, Zeng Y, Liang D, Xie K, Zhang J, Chu Z, **Xiong L\***(2006) Identification of novel stress-responsive transcription factor genes in rice by cDNA array analysis. *Journal of Integrative Plant Biology*. 48:1216-1224.
71. Hu H, Dai M, Yao J, Xiao B, Li X, Zhang Q, **Xiong L\***(2006) Overexpressing a NAM, ATAF, and CUC (NAC) transcription factor enhances drought resistance and salt tolerance in rice. *Proceedings of the National Academy of Sciences of United States of America*. 103: 12987-12992.
72. Xie K, Wu C, **Xiong L\***(2006) Genomic organization, differential expression and interaction of SPL transcription factors and microRNA156 in rice. *Plant Physiology*. 142:280-293.
73. Liang D, Wu C, Li C, Xu C, Zhang J, Kilian A, Li X, Zhang Q, **Xiong L\***(2006)

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Establishment of a patterned GAL4/VP16 transactivation system for discovering gene function in rice. *Plant Journal*. 46: 1059-1072.