Curriculum Vitae

Zheng Yuan
Ph.D., Professor
School of Life Sciences and Biotechnology
Shanghai Jiao Tong University
Room 519, Building 2, 800 Dongchuan Road
Shanghai, 200240, P.R.China
Tel: 0086-21-34206843
Email: zyuan@sjtu.edu.cn

Education

2002-2005 Ph.D in Genetics, Shanghai Institute of Plant Physiology and Ecology (SIPPE), Chinese Academy of Sciences, Shanghai, P.R.China.

1999-2002 M.S in Agronomy, Jiangxi Agricultural University (JAU), Jiangxi, P.R.China.

1995-1999 B.S in Horticulture, JAU, Jiangxi, P.R.China.

Research Experience/Employment

2022- Editor, *Biotechnology Bulletin*

2021- Council member, Shanghai Crop Variety Approval Committee

2020- Editor, *Acta Plant Physiology*

2019-2024 Council member, Chinese Society for Plant Biology

2016- Professor; Project leader; Students' adviser. School of Life Sciences and Biotechnology, SJTU, Shanghai, P.R.China.

2009-2015 Associate Professor; Project leader; Students' adviser. School of Life Sciences and Biotechnology, Shanghai Jiao Tong University (SJTU), Shanghai, P.R.China.

2007-2008 Lecturer; Project leader; Students' adviser. SJTU.

2006-2007 Visitor Scholar, Plant Science Division, Nottingham University. Nottingham, United Kingdom. Adviser: Zoe, A.Wilson.

2005-2006 Lecturer, School of Life Sciences and Biotechnology, SJTU.

Awards and Honors

2018 Shanghai Jiao Tong University Candlelight Award

2018 First Prize, Natural Science Award, Ministry of Education (2017, No.4)

2017 Tang Lixin Excellent Scholar Award, SJTU

2017 Shanghai Jiao Tong University "ZhiYuan" Endowed Chair Professor;

2016 Chenxing Scholar (A), SJTU

2013 First Prize, Progress of Science and Technology in Shanghai (2012, No. 9).

2010 Chenxing Scholar (C), SJTU

2006-2007 Royal Society Fellowship sponsored by the United Kingdom

Teaching Experience

2020- 'Genetics' (SLCB), 32 hours

2020- 'Molecular Biology' (SLCB), 32 hours

2020- 'Plant Biology', 32 hours

2011- 'Developmental and Cell Biology', 48 hours.

2011- 'Genetics' (Zhiyuan College), 96 hours.

2008-2010 'Trends in Plant Science', 36 hours.

2007-2011 Class adviser.

2005 'Plant Biotechnology', 36 hours.

Research Interests:

Rice possesses unique and dramatically different reproductive organs and flower morphology from dicots and non-grass monocots, which is the basic structure unit of inflorescence that determinates yield. The establishment and development of these rice reproductive organs is rather delicate, and is of vital importance for both rice breeding and staple food output. Therefore, research aiming at molecular mechanisms on crop flower development will nourish us with theoretical and practical knowledge for future application to crop breeding. One of my current research fields is concentrated on the molecular mechanisms of rice floral organ initiation and morphogenesis. In our lab, through employing genetic and molecular methods on the basis of numerous mutants, we isolated, showing defective growth of sterile lemma, lemma and palea, we attempt to understand the regulatory network underlying initiation of rice spikelet development, determination of floral organs identity and floral meristem determinacy. On the other hand, we throw an endeavor to cultivate

new rice varieties with high yield, quality and resistance by molecular maker-assisted selection under the sufficient aid of identification of whole genome markers. By exploitation of wide-cross compatibility and inter-subspecies heterosis, the productivity of our varieties has reached to above 15 t/ha. Meanwhile，my extra research interest is targeted to clarify the genetic and molecular mechanisms on high yield traits in heterosis.

Publications

1) Zong J[#], Wang L[#], Zhu L[#], Bian LL, Zhang B, Chen XF, Huang GQ, Zhang XL, Fan JY, Cao LC, Coupland G, Liang WQ, Zhang DB, **Yuan Z***. A rice single cell transcriptomic atlas defines the developmental trajectories of rice floret and inflorescence meristems. ***New Phytologist***. 2022, 234(2): 494-512. (***corresponding author**)
2) Li SQ[#], Cao LC[#], Chen XF, Liu YL, Persson S, Hu JP, Chen MJ, Chen ZB, Zhang DB, **Yuan Z***. A synthetic biosensor for mapping dynamic responses and spatio-temporal distribution of jasmonate in rice. ***Plant Biotechnology Journal.*** 2021, 19(12): 2392-2394. (***corresponding author**)
3) Cao LC, Tian JQ, Liu YL, Chen XF, Li SQ, Persson S, Lu D, Chen MJ, Luo ZJ, Zhang DB, **Yuan Z***. Ectopic expression of OsJAZ6, which interacts with OsJAZ1, alters JA signaling and spikelet development in rice. ***The Plant Journal.*** 2021, 108(4): 1083-1096. (***corresponding author**)
4) Sun LL[#], **Yuan Z[#] (Co-first author)**, Wang DX, Li J, Shi JB, Hu YY, Yu J, Chen XF, Chen SX, Liang WQ, Zhang DB†. Carbon Starved Anther modulates sugar and ABA metabolism to protect rice seed germination and seedling fitness. ***Plant Physiology***. 2021, 187(4):2405-2418.
5) Hu Y, Wang L Jia R, Liang WQ, Zhang XL, Xu J, Chen XF, Lu D, Chen MJ, Luo ZJ, Xie JY, Cao LM, Xu B, Yu Y, Persson S, Zhang DB, **Yuan Z***. Rice transcription factor MADS32 regulates floral patterning through interactions with multiple floral homeotic genes. ***J Exp Bot.*** 2021, 72(7):2434-2449. (***corresponding author**)

6) **Yuan Z***, Persson S, Zhang DB. Molecular and genetic tools to change spikelet development and grain yield. ***aBIOTECH***. 2020, 1: 276-292. (***corresponding author**)

7) Biswas S, Tian JQ, Li R, Chen XF, Luo ZJ, Chen MJ, Zhao XX, Zhang DB, Persson S, **Yuan Z***, Shi JX*. Investigation of CRISPR/Cas9-induced *SD1* rice mutants highlights the importance of molecular characterization in plant molecular breeding. ***J Genet Genomics***, 2020, 47(5): 273-280. (***corresponding author**).

8) Tian JQ, Cao LC, Chen XF, Chen MJ, Zhang P, Cao LM, Persson S, Zhang DB, **Yuan Z***. The OsJAZ1 degron modulates jasmonate signaling sensitivity during rice development. ***Development***. 2019, 146: dev173419. (***corresponding author**)

9) Gu WH, Zhang DB, Qi YP, **Yuan Z***. Generate Photoperiod-Sensitive Genic Male Sterile Rice Lines with CRISPR-Cas9. ***Methods in Molecular Biology***. 2019, 1917, 97-107. (***corresponding author**)

10) **Yuan Z***, Zhang DB*. Floral organ specification. In Ma H, eds, Regulation of Plant Development. Springer New York, New York, NY, 2018. In press (***corresponding author**)

11) Hu CY, Li QL, Shen XF, Quan S, Lin H, Duan L, Wang YF, Luo Q, Qu GR, Han Q, Lu Y, Zhang DB, **Yuan Z***, Shi JX*. Characterization of factors underlying the metabolic shifts in developing kernels of colored maize. ***Sci Rep***. 2016, 6:35479. (***corresponding author**)

12) Li QL, Zhang DB, Chen MJ, Liang WQ, Wei JJ, Qi YP, **Yuan Z***. Development of japonica photo-sensitive genic male sterile rice lines by editing *carbon starved anther* using CRISPR/Cas9. ***J Genet Genomics***, 2016, 43: 415-419. **(*corresponding author)**

13) Fan W, Zong J, Luo ZJ, Chen MJ, Zhao XX, Zhang DB, Qi YP, **Yuan Z***. Development of a RAD-seq based DNA polymorphism identification software, AgroMarker Finder, and its application in rice marker-assisted breeding. ***PLOS ONE***, 2016, 11(1):e0147187. **(*corresponding author)**

14) **Yuan Z**, Zhang DB*. Roles of jasmonate signalling in plant inflorescence and flower development. ***Current Opinion in Plant Biology***, 2015, 27: 44-51.

15) Hu Y, Liang WQ, Yin CS, Yang XL, Ping BZ, Li AX, Jia R, Chen MJ, Luo ZJ, Cai Q, Zhao XX, Zhang DB, **Yuan Z***. Interactions of OsMADS1 with floral homeotic genes

in rice flower development. ***Molecular Plant***, 2015, 8(9): 1366-1384. **(*corresponding author)**

16) Lü Y, Cui X, Li R, Huang P, Zong J, Yao D, Li G, Zhang DB, **Yuan Z***. Development of genome-wide insertion/deletion markers in rice based on graphic pipeline platform. ***Journal of Integrative Plant Biology***, 2015, 57(11): 980-991. **(*corresponding author)**

17) Wang H, Zhang L, Cai Q, Hu Y, Jin Z, Zhao X, Fan W, Huang Q, Luo Z, Chen M, Zhang D, **Yuan Z***. OsMADS32 interacts with B-function proteins and regulates rice flower development. ***Journal of Integrative Plant Biology***, 2015, 57(5):504-513. **(*corresponding author)**

18) Cai Q, **Yuan Z (co-first author)**, Chen MJ, Yin CS, Luo ZJ, Zhao XX, Liang WQ, Hu JP, Zhang DB. Jasmonic acid regulates spikelet development in rice. ***Nature Communications***. 2014, 25: 3476.

19) Li H, **Yuan Z (co-first author)**, Vizcay-Barrena G, Yang C, Liang W, Zong J, Wilson ZA, Zhang DB. *PERSISTENT TAPETAL CELL 1* (*PTC1*) Encodes a PHD-Finger Protein That Is Required for Tapetal Cell Death and Pollen Development in Rice. ***Plant Physiology***, 2011, 56 (2): 615-630.

20) **Yuan Z**, Gao S, Xue DW, Luo D, Li LT, Ding SY, Yao X, Wilson Z, Qian Q and Zhang DB. *RETARDED PALEA1* (*REP1*) controls palea development and floral zygomorphy in rice. ***Plant Physiology***, 2009, 149(1): 235–244.

21) **Yuan Z**, Yao X, Zhang DB, Sun Y and Huang H. Genome-wide expression profiling in seedlings of the *Arabidopsis* mutant *uro* that is defective in the secondary cell wall formation. ***Journal of Integrative Plant Biology***, 2007, 49(12): 1754-1762. **(cover paper)**

22) Xiao DX, **Yuan Z***. Embryogenesis and seed development in *Sinomanglietia glauca*. ***J of Plant Res***, 2006, 119:163-166. **(*corresponding author)**

23) Chen MJ, **Yuan Z (co-first author)**, Huang H. *DELAYED FLOWERING*, an *Arabidopsis* gene that acts in the autonomous flowering promotion pathway and is required for normal development. ***Journal of Integrative Plant Biology***, 2006, 48(1): 27-34.

24) Guo YL, **Yuan Z (co-first author)**, Sun Y, Liu J, Huang H. Characterizations of an *Arabidopsis* mutant, *upright rosette*, reveal that the *UPRIGHT ROSETTE* gene

is involved in auxin action in plant development. ***Journal of Integrative Plant Biology***, 2004, 46: 846-853. **(cover paper)**

In Chinese

25) Liu YL, Fan JY, Chen XF, Xu SY, Zhang DB, **Yuan Z***. Preliminary study on the role of OsAP2-4 in regulating rice tillers development. ***Plant Physiology Journal***, 2022, 58 (5): 817-824. **(*corresponding author)**
26) Fan JY, Chen XF, Lin S, Shen ZY, Zhang DB, Yuan Z*. Preliminary study on the functions of euAP2-like transcription factors in rice flower development***Plant Physiology Journal***, 2020, 56 (5): 939-948. **(*corresponding author, cover paper)**
27) Wu D, Yuan Z*, Zhang DB*. Advances in molecular mechanisms of rice spikelet organogenesis. ***Chinese Bulletin of Life Sciences***, 2018, 30(11): 1173-1183. **(*corresponding author)**
28) Gu WH, Tian JQ, Zhu MC, Wen ZH, Yan WG, Wang XL, Zhang DB, **Yuan Z***. Development and application of variety-specific molecular markers in authenticity identification of *japonica* rice 'Huaidao 5'. ***Plant Physiology Journal***, 2018, 54 (2): 265-272. **(*corresponding author)**
29) Song F, Li QL, Lu D, Wang L, **Yuan Z***. Genome editing of rice *OsMADS15* gene by using CRISPR-Cas9 system. ***Plant Physiology Journal***, 2017, 53(6): 969-978. **(*corresponding author)**
30) Li QL, Wang YF, Han Q, **Yuan Z***, Shen XF*. Development and application of molecular markers for event-specific identification of waxy corn 'Huwucaihuanuo 1' based on 2b-RAD technique. ***Plant Physiology Journal***, 2016, 52(5): 669-677. **(*corresponding author)**
31) Yu YJ, Zhang DB, **Yuan Z***. The updated functional study of WOX protein family in regulating stem cells development. ***Bulletin of Botany***, 2016, 51(4): 565–574. **(*corresponding author)**
32) Jin ZM, Ping BZ, Shen HJ, Du HQ, Li RQ, Zhu L, Zhang DB, **Yuan Z***. Characterisation and gene mapping of a brittle stem mutant *bc-s1* in rice. ***Bulletin of Botany***, 2016, 51(2): 167-174. **(*corresponding author)**
33) Shen WP, Cai Q, Zhou FL, Zhang JZ, Zhang DB, **Yuan Z***. Advances in the molecular mechanism underlying phytohormones function in regulating rice flower development. ***Plant Physiology Journal***, 2015, 51(5): 593-600. **(*corresponding author)**

34) Wang HH, Cai Q, Chen MJ, Luo ZJ, Zhang DB, **Yuan Z***. Phenotype analyses and gene mapping of *abnormal palea and lodicules*, a rice mutant with abnormal floral organs. ***Bulletin of Botany***, 2014, 49(1): 1-7. (***corresponding author, cover paper**)

35) Luo ZJ, Shen WP, Chen MJ, Liang WQ, Lu JZ, Zhang JZ, Liu K, Zhang DB, **Yuan Z***. Breeding of a Japonica CMS line Jinhui A with yellowish leaf in rice. ***Hybrid Rice***, 2013, 160(03): 15-17. (***corresponding author**)

36) Li L, Tian L, Wang TT, Jiang QG, Luo ZJ, Chen MJ, Zhang JZ, Zhang DB, **Yuan Z***. Preliminary study for the molecular mechanism of low amylose content in high-quality rice (*Oryza Sativa* L.) variety 'Qingxiangruanjing'. ***Plant Physiology Journal***, 2012, 48(2): 147-155. (***corresponding author, cover paper**)

37) **Yuan** Z, Luo LS, Xiao DX. Use of Amplified DNA Sequences for the Genetic Analysis of the Peach Germplasm, ***Acta Agriculturae Universitatis Jiangxiensis*** (Natural Sciences Edition), 2002, 24(2): 172-175.

38) **Yuan Z**, Zhang DB. Molecular mechanism of leaf senescence. ***Plant Physiology Communications,*** 2002, 38(4): 417-422.

39) **Yuan Z**, Pan AH, Jian ZY, Xu SP, Gan SS, Huang H, Zhang DB. Senescence Delay Characterization of Transgenic *Brassica chinensis* L. Containing an Anti-senescence Chimeric Gene *SAG12-IPT*. ***J of Plant Physiology and Molecular Biology***. 2002, 28(5): 379-384.

Publications as co-author:

1) Li XQ, Li R, **Yuan Z**, Zhu ZB, Xu WT, Wang YJ, Zhang DB, and Yang LT*. One versatile Cas9-integrated single-tube duplex quantitative real-time PCR system for rapid analysis of CRISPR/Cas-induced mutants. ***Anal Chem***. 2022, 94(30): 10832-10840.

2) Yang J, **Yuan Z**, Meng Q, Huang G, Périn C, Bureau C, Meunier AC, Ingouff M, Bennett M, Ao P, Liang WQ*, Zhang DB*. Dynamic regulation of auxin response during rice development revealed by newly established hormone biosensor markers. ***Frontiers in Plant Science.*** 2017, 8, 256.

3) Ferguson AC, Pearce S, Band LR, Yang C, Ferjentsikova I, King J, **Yuan Z**, Zhang D, Wilson ZA. Biphasic regulation of the transcription factor *ABORTED MICROSPORES*

(*AMS*) is essential for tapetum and pollen development in Arabidopsis. ***New Phytol***. 2017, 213(2): 778-790.

4) Biswas S, Fan W, Li R, Li S, Ping W, Li S, Naumova A, Peelen T, Kok E, **Yuan Z**, Zhang D, Shi J. The Development of DNA Based Methods for the Reliable and Efficient Identification of Nicotiana tabacum in Tobacco and Its Derived Products. ***Int J Anal Chem***. 2016, 2016: 4352308.

5) Zhang DB, **Yuan Z**. Molecular control of grass inflorescence development. ***Annual Review of Plant Biology***. 2014, 65: 553-578.

6) Xu J, Ding ZW, Vizcay-Barrena G, Shi JX, Liang WQ, **Yuan Z**, Werck-Reichhart D, Schreiber L, Wilson ZA and Zhang DB. *ABORTED MICROSPORES* acts as a master regulator of pollen wall formation in Arabidopsis. ***Plant Cell***, 2014, 26: 1544-1556.

7) Zhang DB, **Yuan Z**, An G, Dreni L, Hu JP, Kater MM. Panicle Development. ***Plant Genetics and Genomics: Crops and Models***. 2013, 5: 279-295.

8) Zhang Z, Zhang Y, Tan HX, Wang Y, Li G, Liang WQ, **Yuan Z**, Hu JP, Ren HY, and Zhang DB*****, *RICE MORPHOLOGY DETERMINANT* encodes the type II formin FH5 and regulates rice morphogenesis, ***Plant Cell***, 2011, 23(2), 681-700.

9) Xu J, Yang C, **Yuan Z**, Zhang D, Gondwe MY, Ding Z, Liang W, Zhang D, Wilson ZA. The *ABORTED MICROSPORES* regulatory network is required for postmeiotic male reproductive development in *Arabidopsis thaliana*. ***Plant Cell***. 2010, 22(1): 91–107.

10) Sun Y, Yang Y, **Yuan Z**, Müller JL, Yu C, Xu Y, Shao X, Li X, Decker EL, Reski R, Huang H. Overexpression of the *Arabidopsis* gene *UPRIGHT ROSETTE* reveals a homeostatic control for indole-3-acetic acid (IAA). ***Plant Physiology***, 2010, 153(3): 1311-1320.

11) Zhang DS, Liang WQ, **Yuan Z**, Li N, Shi J, Wang J, Liu YM, Yu WJ, Zhang DB. *Tapetum Degeneration Retardation* is critical for rice pollen wall development. ***Molecular Plant***, 2008, 1(4):599-610.

12) Qian B, Shen H, Xiong J, Chen L, Zhang L, Jia J, Wang Y, Zhang Z, **Yuan Z**, Cao K, Zhang D. Expression and purification of the synthetic preS1 gene of

Hepatitis B Virus with preferred Escherichia coli codon preference. ***Protein Expression and Purification***, 2006, 48(1):74-80.

13) Jiang D, Yin C, Yu A, Zhou X, Liang W, **Yuan Z**, Xu Y, Yu Q, Wen T, Zhang D. Duplication and expression analysis of multicopy miRNA gene family members in Arabidopsis and rice. ***Cell Research***, 2006, 16(5):507-518.

14) Chu H, Qian Q, Liang W, Yin C, Tan H, Yao X, **Yuan Z**, Yang J, Huang H, Luo D, Ma H, Zhang D. The *FLORAL ORGAN NUMBER4* gene encoding a putative ortholog of *Arabidopsis CLAVATA3* regulates apical meristem size in rice. ***Plant Physiology***, 2006, 142: 1039-1052.

15) Li X, Duan X, Jiang H, Sun Y, Tang Y, **Yuan Z**, Guo J, Liang W, Chen L, Yin J, Ma H, Wang J, Zhang D. Genome-Wide Analysis of Basic/Helix-Loop-Helix Transcription Factor Family in Rice and Arabidopsis. ***Plant Physiology***, 2006, 141:1167-1184.

16) Li N, Zhang DS, Liu HS, Yin CS, Li XX, Liang WQ, **Yuan Z**, Xu B, Chu HW, Wang J, Wen TQ, Huang H, Luo D, Ma H, Zhang DB. The rice *Tapetum Degeneration Retardation* Gene is required for tapetum degradation and anther development. ***Plant Cell***, 2006, 18:2999-3014.

17) Liu HS, Chu HW, Li H, Wang HM, Wei JL, Li N, Ding SY, Huang H, Ma H, Huang CF, Luo D, **Yuan Z**, Liu JH, Zhang DB. (2005) Genetic analysis and mapping of rice (*Oryza sativa* L.) male-sterile (*OsMS-L*) mutant. ***Chinese Sci Bull***, 2005, 50 (2): 122-125.

18) Li H, Xu L, Wang H, **Yuan Z**, Cao X, Yang Z, Zhang D, Xu Y, Huang H. The Putative RNA-dependent RNA polymerase *RDR6* acts synergistically with *ASYMMETRIC LEAVES1* and *2* to repress *BREVIPEDICELLUS* and MicroRNA165/166 in Arabidopsis leaf development. ***Plant Cell***, 2005, 17(8):2157-2171.

19) Chen M, Xia X, Zheng H, **Yuan Z**, Huang H. The *GAOLAOZHUANGREN2* gene is required for normal glucose response and development in *Arabidopsis*. ***J. Plant Res***, 2004, 117: 473-476.