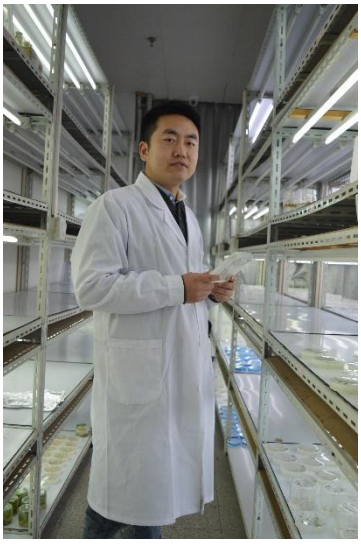
宣　伟

Dr. Wei Xuan



所属单位: 资源与环境科学学院，植物营养学系

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研究方向： 植物根系和资源利用

(Research feild: Plant Root and Soil Resources Utilization)

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（欢迎全国各地优秀学子报考本实验室的硕士、博士研究生，若对本实验室的研究方向感兴趣，欢迎来实验室了解情况。）

教育经历 Education：

1. 本科：2002/09-2006/06，南京农业大学，生命科学学院生物科学专业

(Bachelor of Science, major in Biological Science, College of Life Sciences, Nanjing Agricultural University)

2. 研究生：2006/09-2009/06，南京农业大学，生命科学学院生物化学及分子生物学系（Master of Science, major in Biochemistry & Molecular Biology, College of Life Sciences, Nanjing Agricultural University)

3. 博士：2009/11-2015/07，比利时根特大学（UGent-VIB 研究所），生物化学与生物技术专业 (Ph.D of Biotechnology and Biochemistry, VIB, Department of Plant Systems Biology, VIB, Ghent University, Belgium)

工作阶段 Career/employment：

2015/07 至今（Present)，南京农业大学资源与环境科学学院，高层次人才引进，教授 (Professor, College of Resources and Environmental Sciences, Nanjing Agricultural University)

主要研究方向（Research interests)：

1. 植物营养对植物根系构型可塑性的调控作用；

(Plasticity of root system architecture in response to Nutrient signals)

2. 根系生物钟“root clock”对逆境信号的响应机制以及根系逆境适应性研究；

(Plant root pre-pattening during abiotic stress sensing and tolerance)

3. 植物侧根发生的分子机制及基因调控网络的解析。

(Molecular mechanism of plant lateral root formation and its gene regulatory networks)

主持项目 Research Funding：

1. 国家自然科学基金面上项目

“铵态氮诱导水稻根螺旋化的分子遗传机制和生物学功能解析”，2021-2024

2. 国家自然科学基金优秀青年基金

“植物根系发育与养分资源利用”，2019-2021

3. 国家重点研发计划-科技部政府间科技创新合作重点专项

“根系生物钟调控氮素高效吸收的分子基础”，2016-2019

4. 国家自然科学基金面上项目

“解析根系生物钟响应氮素信号的分子机制”，2017-2020

5. 江苏省高层次创新创业人才引进计划(省双创人才)高校创新类，2016-2019

6. 南京农业大学高层次引进人才启动基金，2017-2020

主要发表论文 Publications (SCI/EI)

1) Zhang, S.N., Zhang, Y.Y., Li, K.N., Yan, M., Zhang, J.F., Yu, M., Tang, S., Wang, L.Y., Qu, H.Y., Luo, L., **Xuan, W.** #, and Xu, G.H. * (2021). Nitrogen Mediates Flowering Time and Nitrogen Use Efficiency via Floral Regulators in Rice. **Current Biology** 31, 671-683
2) Li, Y., Shao, J., Xie, Y., Jia, L., Fu, Y., Xu, Z., Zhang, N., Feng, H., Xun, W., Liu, Y., Shen, Q., **Xuan, W.***, and Zhang, R.* (2021). Volatile compounds from beneficial rhizobacteria Bacillus spp. promote periodic lateral root development in Arabidopsis. **Plant Cell & Environment** 44, 1663-1678.
3) Xuan, W., Xie, Y., and Beeckman, T. (2021). The development of crop root architecture and optimization of nutrition acquisition: the case of rice, **Understanding and improving crop root function**, Burleigh Dodds Science Publishing limited, 33-68.
4) Yu, J., **Xuan, W.**#, Tian, Y.L., Fan, L., Sun, J., Tang, W.J., Chen, G.M., Wang, B.X., Liu, Y.,

Wu, W., Liu, X.L., Jiang, X.Z., Zhou, C., Dai, Z.Y., Xu, D.Y., Wang, C.M., and Wan, J.M. (2020). Enhanced OsNLP4-OsNiR cascade confers nitrogen use efficiency by promoting tiller number in rice. **Plant Biotechnology Journal** 19, 167-176.

5) Jia, L., Xie, Y., Wang, Z., Luo, L., Zhang, C., Pelissier, P.M., Parizot, B., Qi, W., Zhang, J., Hu, Z., Motte, H., Luo, L., Xu, G., Beeckman, T., and **Xuan, W.*** (2020). Rice plants respond to ammonium stress by adopting a helical root growth pattern. **The Plant Journal** 104, 1023-1037.
6) **Xuan, W.**[#], De Gernier, H., and Beeckman, T.* (2020). The dynamic nature and regulation of the root clock. **Development** 147.
7) Zhang, T.R., Ma, M.Y., Chen, T., Zhang, L.L., Fan, L.L., Zhang, W., Wei, B., Li, S.C., **Xuan, W.**[#], Noctor, G., and Han, Y. (2020). Glutathione-dependent denitrosation of GSNOR1 promotes oxidative signalling downstream of H_2O_2. **Plant Cell & Environment** 43, 1175-1191.
8) Yang, T., Feng, H., Zhang, S., Xiao, H., Hu, Q., Chen, G., **Xuan, W.**[#], Moran, N., Murphy, A., Yu, L., and Xu, G. (2020). The Potassium Transporter OsHAK5 Alters Rice Architecture via ATP-Dependent Transmembrane Auxin Fluxes. **Plant Communications** 1, 100052.
9) Smith, S., Zhu, S., Joos, L., Roberts, I., Nikonorova, N., Vu, L.D., Stes, E., Cho, H., Larrieu, A., Xuan, W., Goodall, B., van de Cotte, B., et al. (2020). The CEP5 Peptide Promotes Abiotic Stress Tolerance, As Revealed by Quantitative Proteomics, and Attenuates the AUX/IAA Equilibrium in Arabidopsis. Molecular & cellular proteomics : MCP 19, 1248-1262.
10) Hu, S.K., Zhang, M., Yang, Y.Q., **Xuan, W.**[#], Zou, Z.W., Arkorful, E., Chen, Y., Ma, Q.P., Jeyaraj, A., Chen, X., and Li, X.H. (2020). A novel insight into nitrogen and auxin signaling in lateral root formation in tea plant [Camellia sinensis (L.) O. Kuntze]. **BMC Plant Biology** 20.
11) Xie Y., Wang J., Zheng L., Wang Y., Luo L., Ma M., Zhang C., Han Y., Beeckman T., Xu G., Cai Q., **Xuan W.*** (2019) Cadmium stress suppresses lateral root formation by interfering with the root clock. **Plant Cell & Environment** 42, 3182-3196
12) Tang, W.J., Ye, J., Yao, X.M., Zhao, P.Z., **Xuan, W.**[#], Tian, Y.L., Zhang, Y.Y., Xu, S., An, H.Z., Chen, G.M., Yu, J., Wu, W., Ge, Y.W., Liu, X.L., Li, J., Zhang, H.Z., Zhao, Y.Q., Yang, B., Jiang, X.Z., Peng, C., Zhou, C., Terzaghi, W., Wang, C.M., and Wan, J.M. (2019). Genome-

wide associated study identifies NAC42-activated nitrate transporter conferring high nitrogen use efficiency in rice. **Nature Communications** 10:5279

13) Li, Y., Wang, Y., Tan, S., Li, Z., Yuan, Z., Glanc, M., Domjan, D., Wang, K., **Xuan, W.**[#], Guo, Y., Gong, Z., Friml, J., and Zhang, J. (2020). Root Growth Adaptation is Mediated by PYLs ABA Receptor-PP2A Protein Phosphatase Complex. **Advanced science** 7, 1901455.
14) Wang, P., Shen, L., Guo, J., Jing, W., Qu, Y., Li, W., Bi, R., **Xuan, W.**[#], Zhang, Q., and Zhang, W. (2019). Phosphatidic Acid Directly Regulates PINOID-Dependent Phosphorylation and Activation of the PIN-FORMED2 Auxin Efflux Transporter in Response to Salt Stress. The Plant cell 31, 250-271.
15) Chen Y., Xie Y., Song C., Zheng L., Rong X., Jia L., Luo L., Zhang C., Qu X., **Xuan W.*** (2018) A comparison of lateral root patterning among dicot and monocot plants. **Plant Science**, 274, 201-211
16) **Xuan, W.**, Opdenacker D., Vanneste S., Beeckman, T.* (2018) Long-Term In Vivo Imaging of Luciferase-Based Reporter Gene Expression in Arabidopsis Roots. **Methods in Molecular Biology**, 1761, 177-190
17) Orman-Ligeza, B., Morris, E.C., Parizot, B., Lavigne, T., Babe, A., Ligeza, A., Klein, S., Sturrock, C., **Xuan, W.** [#], Novak, O., Ljung, K., Fernandez, M.A., et al. (2018). The Xerobranching Response Represses Lateral Root Formation When Roots Are Not in Contact with Water. **Current biology** : CB 28, 3165-3173 e3165.
18) **Xuan, W.**[#], Beeckman T., Xu G. (2017) Plant nitrogen nutrition: sensing and signaling. **Current opinion in plant biology**, DOI:10.1016/j.pbi.2017.05.010
19) Fan, X., Naz, M., Fan. X., **Xuan, W.**[#], Miller, A. J. and Xu, G. (2017) Plant Nitrate Transporters: From Gene Function to Application. **Journal of Experimental Botany** doi: 10.1093/jxb/erx011
20) Moller, B.K., **Xuan, W.**[#], and Beeckman, T. (2017) Dynamic control of lateral root positioning. **Current opinion in plant biology** 35, 1-7.
21) **Xuan, W.**[#], Band, L., Kumpf, R., Van Damme, D., Parizot, B., et al. (2016) Cyclic programmed cell death stimulates hormone signaling and root development in Arabidopsis. **SCIENCE**, 351, 384-387

22) Chen Q., Liu Y., Maere S., Lee E., Van Isterdael G., Xie Z., **Xuan W.**[#], et al. (2015) A coherent transcriptional feed-forward motif model for mediating auxin-sensitive PIN3 expression during lateral root development. **Nature Communications** 6, doi: 10.1038/ncomms9821.

23) **Xuan, W.**[#], Audenaert, D., Parizot, B., Moller, B.K., Njo, M.F., De Rybel, B., De Rop, G., et al. (2015). Root Cap-Derived Auxin Pre-patterns the Longitudinal Axis of the Arabidopsis Root. **Current Biology** 25, 1381-1388.

24) **Xuan, W.**[#], Murphy, E., Beeckman, T., Audenaert, D., and De Smet, I. (2013). Synthetic molecules: helping to unravel plant signal transduction. **Journal of Chemical Biology** 6, 43-50.

25) Van Norman, J.M., **Xuan, W.**[#], Beeckman, T., and Benfey, P.N. (2013). To branch or not to branch: the role of pre-patterning in lateral root formation. **Development** 140, 4301-4310.

26) Cui, W., Zhang, J., **Xuan, W.**[#], and Xie, Y. (2013). Up-regulation of heme oxygenase-1 contributes to the amelioration of aluminum-induced oxidative stress in Medicago sativa. **Journal of Plant Physiology** 170, 1328-1336.

27) **Xuan, W.**[#], Xu, S., Li, M., Han, B., Zhang, B., Zhang, J., Lin, Y., Huang, J., Shen, W., and Cui, J. (2012). Nitric oxide is involved in hemin-induced cucumber adventitious rooting process. **Journal of Plant Physiology** 169, 1032-1039.

28) De Rybel, B., Audenaert, D., **Xuan, W.**[#], Overvoorde, P., Strader, L.C., Kepinski, S., Hoye, R., Brisbois, R., Parizot, B., Vanneste, S., et al. (2012). A role for the root cap in root branching revealed by the non-auxin probe naxillin. **Nature Chemical Biology** 8, 798-805

29) Cao, Z., Geng, B., Xu, S., **Xuan, W.**[#], Nie, L., Shen, W., Liang, Y., and Guan, R. (2011). BnHO1, a haem oxygenase-1 gene from Brassica napus, is required for salinity and osmotic stress-induced lateral root formation. **Journal of Experimental Botany** 62, 4675-4689.

30) **Xuan, W.**[#], Xu, S., Yuan, X., and Shen, W. (2008). Carbon monoxide: A novel and pivotal signal molecule in plants? **Plant Signaling & Behavior** 3, 381-382.

31) Han, Y., Zhang, J., Chen, X., Gao, Z., **Xuan, W.**[#], Xu, S., Ding, X., and Shen, W. (2008). Carbon monoxide alleviates cadmium-induced oxidative damage by modulating glutathione metabolism in the roots of Medicago sativa. **New Phytologist** 177, 155-166. **Xuan, W.**[#], Zhu,

F.Y., Xu, S., Huang, B.K., Ling, T.F., Qi, J.Y., Ye, M.B., and Shen, W.B. (2008). The heme oxygenase/carbon monoxide system is involved in the auxin-induced cucumber adventitious rooting process. **Plant Physiology** 148, 881-893.

32) **Xuan W.**[#], Huang L.Q., Li M., Huang B.K., Xu S., Liu H., Gao Y., Shen W.B. (2007) Induction of growth elongation in wheat root segments by heme molecules: a regulatory role of carbon monoxide in plants? **Plant Growth Regulation** 52, 41–51.

33) Cao, Z.Y., Huang, B.K., Wang, Q.Y., **Xuan, W.**[#], Ling, T.F., Zhang, B., Chen, X., Nie, L., and Shen, W.B. (2007). Involvement of carbon monoxide produced by heme oxygenase in ABA-induced stomatal closure in Vicia faba and its proposed signal transduction pathway. **Chinese Science Bulletin** 52, 2365-2373.

34) Cao, Z.Y., **Xuan, W.**[#], Liu, Z.Y., Li, X.N., Zhao, N., Xu, P., Wang, Z., Guan, R.Z., and Shen, W.B. (2007). Carbon monoxide promotes lateral root formation in rapeseed. **Journal of Integrative Plant Biology** 49, 1070-1079.

35) Han, Y., **Xuan, W.**[#], Yu, T., Fang, W.B., Lou, T.L., Gao, Y., Chen, X.Y., Xiao, X., and Shen, W.B. (2007). Exogenous hematin alleviates mercury-induced oxidative damage in the roots of Medicago sativa. **Journal of Integrative Plant Biology** 49, 1703-1713.

36) Liu, K.L., Xu, S., **Xuan, W.**[#], Ling, T.F., Cao, Z., Huang, B.K., Sun, Y.G., Fang, L., Liu, Z.Y., Zhao, N., et al. (2007). Carbon monoxide counteracts the inhibition of seed germination and alleviates oxidative damage caused by salt stress in Oryza sativa. **Plant Science** 172, 544-555.

37) Huang, B.K., Xu, S., **Xuan, W.**[#], Li, M., Cao, Z.Y., Liu, K.L., Ling, T.F., and Shen, W.B. (2006). Carbon monoxide alleviates salt-induced oxidative damage in wheat seedling leaves. **Journal of Integrative Plant Biology** 48, 249-254.

38) Xu, J., **Xuan, W.**[#], Huang, B.K., Zhou, Y.H., Ling, T.F., Xu, S., and Shen, W.B. (2006). Carbon monoxide-induced adventitious rooting of hypocotyl cuttings from mung bean seedling. **Chinese Science Bulletin** 51, 668-674.

39) Xu, S., Sa, Z.S., Cao, Z.Y., **Xuan, W.**[#], Huang, B.K., Ling, T.F., Hu, Q.Y., and Shen, W.B. (2006). Carbon monoxide alleviates wheat seed germination inhibition and counteracts lipid peroxidation mediated by salinity. **Journal of Integrative Plant Biology** 48, 1168-1176.