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研究方向：植物光生物学；作物光环境生理生态与调控技术；  
植物工厂系统装备与栽培技术；设施栽培

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### 个人简介：

1990年在南京农业大学获学士学位后入本校农学院工作，2002年获博士学位，2008年博士后出站。近20年来，致力于从事植物光生物学、作物光环境生理与调控技术以及农业信息工程研究；从事作物光环境调控系统装备与植物工厂系统装备与栽培技术研发。主持和承担“十三五”国家重点研发计划、“十一五”和“十二五”国家“863”计划项目、国家科技支撑计划、国家自然科学基金、江苏省科技支撑计划、江苏省自然科学基金项目、农业部公益性行业科技项目和企业委托项目等课题的研究工作。

中国生物技术学会会员；国家半导体照明工程研发及产业联盟应用推广工作委员会核心成员、农业生物照明工作组组长；中国照明学会会员；中国照明学会光生物和光化学专业委员会委员；SCI源刊Scientia Horticulturae、Plant Physiology and Biochemistry、Hortscience和botanical studies的同行审稿人；国家科技计划高新领域网评专家、国家自然科学基金网评专家。

获得国家发明专利授权多项，在SCI期刊、国内核心期刊和EI源刊发表论文30多篇，主编教材2部，参编教材3部，作为主要完成人获省部级科技进步奖2项。

### 国家发明专利：

- 1、徐志刚等. 国家发明专利：一种光谱柔性可调的LED光源系统，ZL200710133284.1，授权，（已转让至企业）
- 2、徐志刚等. 国家发明专利：规模化组培苗生长环境二氧化碳浓度自动调控装置，ZL200610097992.X，授权，（已转让至企业）
- 3、徐志刚，樊小雪. 国家发明专利：一种基于LED节能光源的小青菜室内栽培技术，ZL201310156304.2，授权，（已转让至企业）
- 4、徐志刚，刘梦溪. 国家发明专利：一种借助于光源控制进行桔梗快繁的方法，ZL201310206548.7，授权，（已转让至企业）
- 5、徐志刚. 国家发明专利：一种光源移行的温室补光装置，ZL201110450094.9，授权
- 6、徐志刚，徐杰明. 国家发明专利：植物室内栽植系统，ZL201410564388.8，授权
- 7、徐志刚，徐杰明. 实用新型专利：植物室内栽植系统，ZL201420609852.6，授权
- 8、李慧敏，徐志刚，唐灿明. 国家发明专利：一种陆地棉快繁光源的控制方法，ZL201010178927.6，授权
- 9、唐灿明，徐志刚，李慧敏. 国家发明专利：一种陆地棉室内育苗的控制方法，ZL20102021196.2，授权
- 10、焦学磊，徐志刚等. 国家发明专利、实用新型专利：一种植物工厂栽培架智能LEDs灯架调控系统，ZL201310163011.7，授权
- 11、唐灿民，李慧敏，徐志刚. 国家发明专利：一种甘蓝型油菜组织培养的光源控制方法，

ZL201110210419.6, 授权

12、曹卫星, 徐志刚等. 国家发明专利: 便携式多通道作物叶片氮素营养指标无损监测装置, ZL 200710019340.9, 授权

13、曹卫星, 徐志刚等. 国家发明专利: 机载式作物氮素信息高密度无损采集方法, ZL200910034988.2, 授权

14、宋光明, 朱艳, 张军, 徐志刚. 国家发明专利: 作物氮素无线传感网络监测系统, ZL201010501019.6, 授权

### 奖励:

北京市科技进步三等奖 1 项: 植物无糖组培快繁工厂化生产技术研究与应用 (获奖时间: 2008.12), 排名第三

中华农业科技奖二等奖 1 项: 植物 LED 光环境精准调控及节能高效生产技术研究与应用 (获奖时间 2013 年 12 月) 排名第三

国家科技进步一等奖 1 项: 稻麦生长无损监测与精确诊断技术, 2015 年, 排名第十三

高等学校国家级实验教学中心建设成果一等奖 1 项: 植物组培 LED 智能光控系统, 2016, 排名第一

### 近期论文:

1. Huimin Li, Zhigang Xu\*, Canming Tang. Effect of light-emitting diodes on growth and morphogenesis of upland cotton (*Gossypium hirsutum* L.) plantlets *in vitro*. *Plant Cell Tiss Organ Cult*, 2010,103:155-163 (Corresponding authors) SCI

2. Liu Mengxi; Xu zhigang\*; Yang Yang; Feng Yijie. Effects of Different Spectral Lights on *Oncidium* PLBs Induction, Proliferation, and Plant Regeneration. *Plant Cell Tiss Organ Cult*. 2011, 106:1-10 (Corresponding authors) SCI

3. Liu Xiaoying, Chang Taotao, Guo Shirong, Xu Zhigang\*. Regulation of chloroplast ultrastructure, cross-section anatomy of leaves and morphology of stomata of cherry tomato by different light irradiations of LEDs. *HortScience*, 2011, 45 (2):1-5 (Corresponding authors) SCI

4. Huimin Li, Canming Tang, Zhigang Xu\*, Xiaoying Liu. Effects of Different Light Sources on the Growth of Non-heading Chinese Cabbage (*Brassica campestris* L.). *Journal of Agricultural Science*, 2012, 4 (4). (Corresponding authors) SCI

5. Liu, X.Y., Chang, T.T., Guo, S.R., Xu, Z.G\*. and Li, J. 2011. Effect of Different Light Quality of LED on Growth and Photosynthetic Character in Cherry Tomato Seedling. *Acta Hort. (ISHS)* 907:325-330. (Corresponding authors) SCI

6. Liu XiaoYing, Guo ShiRong, Xu ZhiGang\*, Jiao XueLei, et al. Regulation of the growth and photosynthesis of cherry tomato seedlings by different light irradiations of LED, *African Journal of Biotechnology Journal*. *African Journal of Biotechnology*, 2012, 11(22): 6169-6177. (Corresponding authors) SCI

7. Huimin Li, Canming Tang, Zhigang Xu\*. The effects of different light qualities on rapeseed (*Brassica napus* L.) plantlet growth and morphogenesis *in vitro*. *Scientia Horticulturae*, 2013, 150: 117 - 124. (Corresponding authors) SCI

8. Xiao-Xue Fan; Zhi-Gang Xu\*; Xiao-Ying Liu; Can-Ming Tang; Li-Wen Wang; Xue-lin Han. Effects of light intensity on the growth and leaf development of young tomato plants grown under a combination of red and blue light. *Scientia Horticulturae*, 2013, 153 : 50 - 55 (Corresponding authors) SCI

9. Xiao-Xue Fan, Jie Zang, Zhi-Gang Xu\*, ShiRong Guo, XueLei Jiao, XiaoYing Liu, Ying Gao.

Effects of Different Light Quality on Growth, Chlorophyll Concentration and Chlorophyll Biosynthesis Precursors of Non-heading Chinese Cabbage (*Brassica campestris* L.) *Acta*

- Physiologiae Plantarum 2013, 35:2721 - 2726 (Corresponding authors) SCI
10. XiaoXue Fan, Zang Jie, ZhiGang Xu\*, Jiao Xuelei, Liu Xiaoying, Gao Ying. Effects of different light spectra on photosynthetic structures and photosynthate of non-heading Chinese cabbage. Research on Crops 2013,14( 2) :555-560 (Corresponding authors) SCI
  11. Mengxi Liu, Zhigang Xu\*, Shirong Guo, Canming Tang, Xiaoying Liu, Xuelei Jiao. Evaluation of leaf morphology, structure and biochemical substance of balloon flower (*Platycodon grandiflorum* (Jacq.) A. DC.) plantlets *in vitro* under different light spectra. Scientia Horticulturae, 2014, 174 :112–118 (Corresponding authors) SCI
  12. Effects of green and red lights on the growth and morphogenesis of potato (*Solanum tuberosum* L.) plantlets *in vitro*. Xiaofeng Ma, Yongping Wang, Mengxi Liu, Jianmin Xu, Zhigang Xu. Scientia Horticulturae, 2015,190, 104 - 109. (Corresponding authors) SCI
  13. EFFECTS OF THE SPECTRAL ENERGY DISTRIBUTION OF RED, BLUE, AND FAR-RED LIGHT ON THE INDUCTION OF ANOECTOCHILUS ROXBURGHII (WALL.) LINDL. ADVENTITIOUS SHOOTS. Shiwen Zhou, Ruining Li, Wenwen Huan, Zhigang Xu\*, Xiaoying Liu, and Xuelei Jiao. Propagation of Ornamental Plants, 2016, 16(2): 39-46. (Corresponding authors) SCI
  14. Morphological, Photosynthetic, and Physiological Responses of Rapeseed Leaf to Different Combinations of Red and Blue Light at the Rosette Stage. Chang Shengxin, Li Chunxia, Yao Xuyang, Chen Song, Jiao Xuelei, Liu Xiaoying, Xu Zhigang\* and Guan Rongzhan. Frontiers in Plant Science, 2016, 7: 1144. (Corresponding authors) SCI
  15. Effect of irradiating the leaf abaxial surface with supplemental light-emitting diode lights on grape photosynthesis. C.-X. LI, S.-X. CHANG, M. KHALIL-UR-REHMAN, Z.-G.XU \* and J.-M. TAO . Australian Journal of Grape and Wine Research, 3, 2017:1-8. (Corresponding authors) SCI
  16. An RNA-Seq Analysis of Grape Plantlets Grown *in vitro* Reveals Different Responses to Blue, Green, Red LED Light, and White Fluorescent Light. Chun-Xia Li, Zhi-Gang Xu\*, Rui-Qi Dong, Sheng-Xin Chang, Lian-Zhen Wang, Muhammad Khalil-Ur-Rehman<sup>1</sup> and Jian-Min Tao<sup>1\*</sup>, Frontiers in Plant Science, 2017, 8: 1-16. (Corresponding authors) SCI
  17. Yun Zhang, Xun Xie, Ze-Kun Yang, Jiong-Ju Hao, Zhi-Gang Xu\* and Hong-Wei Yang\*. Study on the Spectrum of Photonic Crystal Cavity and Its Application in Measuring the Concentration of NaCl Solution. ZEITSCHRIFT FÜR NATURFORSCHUNG SECTION A-A JOURNAL OF PHYSICAL SCIENCES, 2017, 72(4):345-349. (Corresponding authors) SCI
  18. Liping Lu, Taoping Hu, Zhigang Xu\*. Structural characterization of astaxanthin aggregates as revealed by analysis and simulation of optical spectra. SPECTROCHIMICA ACTA PART A-MOLECULAR AND BIOMOLECULAR SPECTROSCOPY, 2017, 185:85-92. (Corresponding authors) SCI
  19. Yun Zhang, Lei Xie, Jiong-Ju Hao, Yu-Jie Liu, Bao-Liang Ma, Zhi-Gang Xu, Hong-Wei Yang. A new method study of spectral measurement and prediction based on the nonlinear solution concentration of alcohol. PHYSICA B-CONDENSED MATTER, 2017, 516:32-35
  20. Hui-min LI\*, Can-ming Tang\*, Zhi-gang XU. Effects of different light quality on growth, photosynthetic characteristic and chloroplast ultrastructure of upland cotton (*Gossypium hirsutum* L.) seedlings. Emirates Journal of Food and Agriculture. 2017. 29(x): 1-6 SCI
  21. Sheng-xin CHANG, Chu PU, Rong-zhan GUAN, Min PU, Zhi-gang XU\*. Transcriptional and translational responses of rapeseed leaves to red and blue lights at the rosette stage. Journal of Zhejiang University-SCIENCE B (Biomedicine & Biotechnology), 2018 19(8):581-595 (Corresponding authors) SCI
  22. X.Y. LIU, X.L. JIAO, T.T. CHANG, S.R. GUO, and Z.G. XU<sup>+</sup>. Photosynthesis and leaf development of cherry tomato seedlings under different LED-based blue and red photon flux ratios. PHOTOSYNTHEtica, 2018, 56 (4): 1212-1217 (Corresponding authors) SCI
  23. Ruining Li, Wenwen Huang, Xiaoxiao Wang, Xiaoying Liu, and Zhigang Xu\*. Effects of Yellow, Green, and Different Blue Spectra on Growth of Potato Plantlets *In Vitro*. HORTSCIENCE, 2018, 53(4):541–546. (Corresponding authors) SCI
  24. Tao Wen, Liangqin Chen, Weixuan Su, Ruining Li, Xuelei Jiao, Xiaoying Liu, Zhigang Xu\*, and Zengxu Xiang. FLOWERING AND FLORAL DEVELOPMENT OF DENDROBIUM

OFFICINALE KIMURA ET MIGO PLANTLETS IN VITRO UNDER DIFFERENT LIGHT SPECTRA. *Propagation of Ornamental Plants*. 2018, 18(18): 26-36. (Corresponding authors) SCI

25. Jianmin Xu, Zhiming Yan, Zhigang Xu\*, Yuanhua Wang, Zhenqiang Xie. Transcriptome analysis and physiological responses of the potato plantlets in vitro under red, blue, and white light conditions. *3 Biotech*, 2018, 8:394 (Corresponding authors) SCI

26. XIAOXUE FAN, BO SONG, LONGZHENG CHEN, HAI XU, ZHIGANG XU<sup>1</sup>\* AND XIAOMING XU. EFFECTS OF DIFFERENT LIGHT SOURCES ON THE QUALITY AND SAFETY OF NON-HEADING CHINESE CABBAGE. *Bangladesh J. Bot.* 47(3): 671-676, 2018 (September). (Corresponding authors) SCI

27. Wei He, Zhi-Wu Huang, Jiang-Peng Li, Wei-Xuan Su, Lijun Gan\* & Zhi-Gang Xu\*. Effect of different light intensities on the photosynthate distribution in cherry tomato seedlings. *The Journal of Horticultural Science and Biotechnology*, 2019, <https://doi.org/10.1080/14620316.2019.1575775>, (Corresponding authors) SCI

28. Zhan Wang, Yin-kun Li, Wen-zhong Guo, Zhi-gang Xu\*, Li-chun Wang, Li Ma. Yield, nitrogen use efficiency and economic benefits of biochar additions to Chinese Flowering Cabbage in Northwest China. *Nutr Cycl Agroecosyst* (2019) 113:337–348. (Corresponding authors) SCI

29. Wei He, Jin Li, Min Pu, Zhi-Gang Xu\* and Lijun Gan. Response of photosynthate distribution in potato plants to different LED spectra. *Functional Plant Biology*, 2020, <https://doi.org/10.1071/FP20131>. (Corresponding authors) SCI

30. Ruining Li, Jie You, Chen Miao, Le Kong, Jiahuan Long, Yongzhe Yan, Zhigang Xu\*, Xiaoying Liu\*. Monochromatic lights regulate the formation, growth, and dormancy of in vitro-grown *Solanum tuberosum* L. microtubers. *Scientia Horticulturae*, 261 (2020), 108947. (Corresponding authors) SCI

31. Xiaoying Liu, Zheng Chen, Mohammad Shah Jahan, Yixuan Wen, Xuyang Yao, Haifeng Ding, Shirong Guo and Zhigang Xu\*. RNA-Seq analysis reveals the growth and photosynthetic responses of rapeseed (*Brassica napus* L.) under red and blue LEDs with supplemental yellow, green, or white light. *Horticulture Research* (2020) 7:206. (Corresponding authors) SCI

32. Wei He, Chen Miao, Jie You, Lijun Gan, Zhi-Gang Xu\*. Effects of Red and Blue Light with Supplemental White Light on Growth, Carbohydrate Metabolism, and Yield of Virus-Free Potato in Plant Factories. *American Journal of Potato Research*, 2020, <https://doi.org/10.1007/s12230-020-09803-2>. (Corresponding authors) SCI

33. Wei He, Min Pu, Jin Li, Zhi-Gang Xu\*, Lijun Gan. Potato Tuber Growth and Yield Under Red and Blue LEDs in Plant Factories. *Journal of Plant Growth Regulation*, 2020, <https://doi.org/10.1007/s00344-020-10277-z>. (Corresponding authors) SCI

34. Ruining Li, Jiahuan Long, Yongzhe Yan, Jiaming Luo, Zhigang Xu\*, and Xiaoying Liu. Addition of White Light to Monochromatic Red and Blue Lights Alters the Formation, Growth, and Dormancy of In Vitro-grown *Solanum tuberosum* L. Microtubers. *HORT SCIENCE*, 2020, <https://doi.org/10.21273/HORTSCI14548-19>. (Corresponding authors) SCI

### 近年来实施的课题:

- 1) “十三五”国家重点研发计划“设施果菜生产 LED 关键技术研究与应用示范 (2017YFB0403903)”课题(2017-2021), 实施中
- 2) 国家自然科学基金项目“光谱分布诱导马铃薯试管薯及其调节光合产物转运的机制”(11674174)课题(2017-2020), 通过验收
- 3) 农业部公益性行业科技计划“园艺作物设施栽培光环境精准调控关键技术研究与应用示范”(201303108)课题(2013-2017), 通过验收。
- 4) “十二五”国家 863 高技术研究计划项目“基于光温耦合的植物工厂节能环境控制技术”(2013AA103003)课题(2013-2017), 通过验收。
- 5) 国家自然科学基金项目“设施蔬菜幼苗对不同光谱能量分布的响应机制与光控基准研究”(30972035)课题(2010-2012), 通过验收。
- 6) “十一五”国家“863”高技术研究计划项目“半导体 LED 光源在植物组培中的应用研

究”（2006AA03A165）课题研究（2006-2009），通过验收。

7) 江苏省科技支撑计划“半导体照明在现代设施农业中应用的新技术研发与示范”（BE2011197）课题（2011-2014），通过验收。

8) “十二五”国家 863 高技术研究计划项目“LED 非视觉照明技术—LED 农业照明研究”（2011AA03A114）课题（2011-2013），通过验收。

9) “十二五”国家科技支撑计划项目“现代农业与养殖业专用 LED 光源开发与示范”（2011BAE01B01）课题（2011-2014），通过验收。