

韦中，1985 年出生，安徽临泉人。南京农业大学资源与环境科学学院教授，博士生导师，从事微生态与根际健康、秸秆生物高值化利用等研究。围绕根际微生态与土传病害防控这一重大问题，在抑病型根际菌群装配、菌群互作、益生菌群构建以及根际菌群调控等方面取得重要突破。以第一或通讯作者在 Nature Biotechnology、Nature Communications、mBio、Trends in Plant Science、Ecology letters 和 Science Advances 等国内外著名期刊上发表论文 20 多篇。申请和授权发明专利 19 项。获得了 2018-2019 年中华农业科技一等奖（第三完成人），被聘为土壤学报编委（2018）。2019 年获得国家自然科学基金优秀青年项目。

## 一、教育经历

2007/09–2012/05 博 士 南京农业大学 资环与环境科学学院  
2003/09–2007/06 学 士 南京农业大学 资环与环境科学学院

## 二、工作经历

2019/10– 教 授 南京农业大学 资源与环境科学学院  
2015/12–2019/10 副教授 南京农业大学 资源与环境科学学院  
2014/11–2018/10 访 学 荷兰乌特勒支大学 环境生物学系累计 1 年  
2013/01–2015/01 博士后 南京农业大学 生态学博士后流动站  
2012/06–2015/12 讲 师 南京农业大学 资源与环境科学学院

## 三、获奖情况

2019 年 中华农业科技一等奖（第三完成人），经济作物抑病型土壤微生物区系调控技术创建与应用。

2017 年 甘肃省科技进步一等奖（第五完成人），西北非耕地园艺作物

## 栽培基质优化配制技术与产业化示范

2017年 大北农优秀青年科学家奖

2016年 江苏省青蓝工程优秀青年骨干，2万元；

2016年 Hayward 旅费奖，法国图卢兹国际青枯菌大会，250欧元；

2015年 中华农业科技奖：优秀创新团队奖(等同于科研成果一等奖，第15完成人)，有机肥与土壤微生物创新团队

2014年 旅费奖，法国第戎第一届全球土壤生物多样性大会，500欧元；

## 四、主持项目

2020/01-2020/12 中央高校基本业务费，根际微生物生态与土壤健康，30万元；

2020/01-2022/12 国家自然科学基金，根际微生物生态与土壤健康，150万元；

2019/03-2021/12 英国皇家科学院国际合作项目，噬菌体疗法，8.73万英镑；

2018/07-2022/07 国家重点研发计划项目(骨干)，器官互作与根际微生物生态在园艺作物抗逆和克服连作障碍中的作用机制，65万元；

2017/01-2019/12 南京农业大学自主创新重点研究项目，根际益生菌工程菌群构建与作用机制研究，9万元

2017/07-2020/07 江苏自然科学基金优秀项目，根际微生物生态与调控，50万元；

2017/01-2020/12 国家自然科学基金面上项目，噬菌体协同生防细菌

抑制土传青枯菌入侵番茄根际的机制研究，直接经费 66 万元；

2015/11-2017/12 中国科协青年人才托举工程，45 万元，托举对象；

2015/01-2019/12 973 项目（子课题），番茄抑病型土壤微生物区系形成机制研究，80 万元；

2014/09-2016-09 淮安市产学研协同创新计划，利用功能菌群创制抗病型育苗基质，10 万元；

2014/01-2016/12 国家自然科学基金青年基金，番茄根际劳尔氏属菌 (*Ralstonia* spp.) 种间竞争机制研究，25 万元；

2013/06-2016/06 江苏省自然科学基金青年基金，番茄根际有益菌和青枯病致病菌竞争机制研究，20 万元；

2013/01-2015/12 国家科技支撑计划（子课题），长三角现代农业区循环农业及废弃物资源化技术集成与示范，60 万元；

2013/06-2015/06 南京农业大学青年创新基金项目，5 万元；

2013/06-2016/06 中国博士后基金，5 万元；

2014/01-2015/12 高等学校博士学科点专项科研基金，4 万元；

2013/01-2014/01 南京农业大学科研启动经费，1 万元；

## 五、发表论文

1. Xiaofang Wang#, **Zhong Wei** #\*, Keming Yang, Jiangning Wang, Alexandre Jousset, Yangchun Xu, Qirong Shen\* and Ville-Petri Friman\*. Phage combination therapies for bacterial wilt disease in tomato. **Nature Biotechnology**, 2019
2. **Zhong Wei**\*, Yian Gu\*, Ville-Petri Friman, George A. Kowalchuk, Yangchun Xu†, Qirong Shen†, Alexandre Jousset. Initial soil microbiome composition

- and functioning predetermine future plant health. **Science Advances** 2019; 5: eaaw0759
3. Chunlan Yang\*, Yue Dong\*, Ville-Petri Friman, Alexandre Jousset, **Zhong Wei\***, Yangchun Xu, Qirong Shen. Carbon resource richness shapes bacterial competitive interactions by alleviating growth-antibiosis trade-off. *Functional Ecology*. 2019;1–8.
  4. Wei Xue Xuejiao Hu **Zhong Wei** Xinlan Mei Xingjian Chen Yangchun Xu. A fast and easy method for predicting agricultural waste compost maturity by image-based deep learning. *Bioresource Technology*. 2019, 290: 121761.
  5. 薛卫 , 胡雪娇 , **韦中** , 梅新兰 , 陈行健 , 徐阳春 . 基于卷积神经网络的堆肥腐熟度预测. *植物营养与肥料学报*, 2019, 25(11): 1-12.
  6. Tianjie Yang, **Zhong Wei\***, Ville-Petri Friman, Shaohua Gu, George A. Kowalchuk, Yangchun Xu, Qirong She, Alexandre Jousset. Resource stoichiometry shapes community invasion resistance via productivity-mediated species identity effects. **Proc. R. Soc. B, 2019, 285: 20182035.**
  7. Mei Li **Zhong Wei** Jianing Wang Alexandre Jousset Ville - Petri Friman Yangchun Xu Qirong Shen Thomas Pommier. Facilitation promotes invasions in plant-associated microbial communities. *Ecology Letters* (2019) 22: 149–158..
  8. Liao, Hanpeng; Lu, Xiaomei; Rensing, Christopher; Chen, Zhi; Friman, Ville; Geisen, Stefan; **Wei, Zhong**; Zhou, Shungui; Zhu, Yongguan. Hyperthermophilic composting accelerates the removal of antibiotic resistance genes and mobile genetic elements. *Environ. Sci. Technol.*, 2018, 52 (1): 266-276.
  9. **Zhong Wei**, Jie Hu, Yi'an Gu, Shixue Yin, Yangchun Xu\*, Alexandre Jousset, Qirong Shen, and Ville-Petri Friman, 2017, *Ralstonia solanacearum* pathogen disrupts bacterial rhizosphere microbiome during an invasion. **Soil Biology & Biochemistry**, 2018, 118: 8-17.
  10. Waseem Raza, Xinlan Mei, **Zhong Wei**, Ning Ling, Jun Yuan, Jichen Wang, Qiwei Huang, Qirong Shen. Profiling of soil volatile organic compounds after long-term application of inorganic, organic and organic-inorganic mixed fertilizers and their effect on plant growth. *Science of The Total Environment*. 2017: 607–608, 326-338.

11. Gaofei Jiang, **Zhong Wei**, Jin Xu, Huilan Chen, Yong Zhang, Xiaoman She, Alberto P. Macho, Wei Ding and Boshou Liao. Bacterial Wilt in China: History, Current Status, and Future Perspectives. *Frontiers in Plant Science*. 2017, 8:1549. IF<sub>5-year</sub> = 4.205.
12. 王誉瑶, **韦中**, 徐阳春, 沈其荣. 溶磷菌株组合的溶磷效应及对玉米生长的影响. *植物营养与肥料学报* 2017, 23(1): 262–268.
13. 浩折霞, 黄大鹏, 顾少华, **韦中**, 徐阳春, 沈其荣. 酒糟 – 牛粪堆肥复配瓜果类蔬菜育苗基质配方筛选. *南京农业大学学报*. 2017, 40(3): 457-463.
14. Jie Hu, **Zhong Wei**, Simone Weidner, Ville-Petri Friman, Yang-chun Xu\*, Qi-rong Shen, Alexandre Jousset, 2017. Probiotic *Pseudomonas* communities enhance plant growth and nutrient assimilation via diversity-mediated ecosystem functioning. ***Soil Biology & Biochemistry***, 2017, 113: 122e129.
15. **Zhong Wei**, Alexandre Jousset, 2017. Plant breeding goes microbial. *Trends in Plant Science*, 2017, 22(7):555-558. **IF<sub>5-year</sub> = 12.100.**
16. Tianjie Yang, **Zhong Wei\***, Ville-Petri Friman, Yangchun Xu, Qirong Shen, George A. Kowalchuk, Alexandre Jousset. Resource availability modulates biodiversity-invasion relationships by altering competitive interactions. *Environmental Microbiology*, 2017, 19(8), 2984–2991. IF<sub>5-year</sub> = 6.288.
17. Jianfeng Huang, **Zhong Wei**, Jie Hu, Chunlan Yang, Yi'an Gu, Xinlan Mei, Qirong Shen, Yangchun Xu. *Chryseobacterium nankingense* sp. nov. WR21T effectively suppresses *Ralstonia solanacearum* growth via intensive root exudates competition, ***Biocontrol***, 2017, 62:567-577.
18. Alexandre Jousset, Christina Bienhold, Antonis Chatzinotas, Laure Gallien, Angélique Gobet, Viola Kurm, Kirsten Küsel, Matthias C Rillig, Damian W Rivett, Joana F Salles, Marcel GA van der Heijden, Noha H Youssef, Xiaowei Zhang, **Zhong Wei** and WH Gera Hol. Where less may be more: how the rare biosphere pulls ecosystems strings. *The ISME Journal*, 2017, 1–10. doi:10.1038/ismej.2016.174.
19. **Zhong Wei**, Jianfeng Huang, Tianjie Yang, Alexandre Jousset, Yangchun Xu, Qirong Shen, Ville-Petri Friman. Seasonal variation in the biocontrol efficiency of bacterial wilt is driven by temperature-mediated changes in bacterial competitive interactions. *Journal of applied ecology*, 2017, 54 , 1440–1448.

20. Honggui Wang, **Zhong Wei**, Lijuan Mei, Jingxin Gu, Suisui Yin, Karoline Faust, Jeroen Raes, Ye Deng, Yulong Wang, Qirong Shen, Shixue Yin\*. Combined use of network inference tools identifies ecologically meaningful bacterial associations in a paddy soil. *Soil Biology and Biochemistry*, 2017, 105:227-235.
21. Xiaofang Wang, **Zhong Wei\***, Mei Li, Xueqi Wang, Anqi Shan, Xinlan Mei, Alexandre Jousset, Qirong Shen, Yangchun Xu, and Ville-Petri Friman. Parasites and competitors suppress bacterial pathogen synergistically due to evolutionary trade-offs. *Evolution*, 71-3: 733-746.
22. Yian Gu, Yugang Hou, Dapeng Huang, Zhexia Hao, Xiaofang Wang, **Zhong Wei\***, Alexandre Jousset, Shiyong Tan, Dabing Xu, Qirong Shen, Yangchun Xu\*\*, Ville-Petri Friman. Application of biochar reduces *Ralstonia solanacearum* infection via effects on pathogen chemotaxis, swarming motility, and root exudate adsorption. *Plant Soil*, 2017, 415:269-281.
23. Hu J, **Wei Z**, Friman V-P, Gu S-H, Wang X-F, Eisenhauer N, Yang T-J, Ma J, Shen Q-R, Xu Y-C, Jousset A. 2016. Probiotic diversity enhances rhizosphere microbiome function and plant disease suppression. *mBio*, 2016, 7(6):e01790-16.
24. Gu, Yian; **\*Wei, Zhong**; Wang, Xueqi; Friman, Ville-Petri; Huang, Jianfeng; Wang, Xiaofang; Mei, Xinlan; \*Xu, Yangchun; Shen, Qirong; Jousset, Alexandre. Pathogen invasion indirectly changes the composition of soil microbiome via shifts in root exudation profile. ***Biology and Fertility of Soils***, 2016, 52(7): 997-1005.
25. \*Sun, Mingming; Ye, Mao; Schwab, Arthur P.; Li, Xu; Wan, Jinzhong; **Wei, Zhong**; Wu, Jun; Friman, Ville-Petri; Liu, Kuan; Tian, Da; Liu, Manqiang; Li, Huixin; Hu, Feng; Jiang, Xin. Human migration activities drive the fluctuation of ARGs: Case study of landfills in Nanjing, eastern China. ***Journal of Hazardous Materials***, 2016, 315: 93-101.
26. Raza, Waseem; Wang, Jichen; Wu, Yuncheng; Ling, Ning; **Wei, Zhong**; Huang, Qiwei; \*Shen, Qirong. Effects of volatile organic compounds produced by *Bacillus amyloliquefaciens* on the growth and virulence traits of tomato bacterial wilt pathogen *Ralstonia solanacearum*. ***Applied Microbiology and Biotechnology***, 2016, 100(17): 7639-7650.

27. Raza, Waseem; **Wei, Zhong**; Ling, Ning; Huang, Qiwei; \*Shen, Qirong. Effect of organic fertilizers prepared from organic waste materials on the production of antibacterial volatile organic compounds by two biocontrol *Bacillus amyloliquefaciens* strains. **Journal of Biotechnology**, 2016, 227:43-53
28. 梅新兰; 闪安琪; 蒋益; **韦中**; 王誉瑶; 王世梅; 沈其荣; 徐阳春; 刘建. 适应玉米的溶磷细菌筛选及其对玉米生长的影响. *土壤学报*, 2016, 53(2): 502-509.
29. Zhong **Wei**, Jian-Feng Huang, Jie Hu, Yi-An Gu, Chun-Lan Yang, Xin-Lan Mei, Qi-Rong Shen, Yang-Chun Xu, Ville-Petri Friman. (2015) Altering Transplantation Time to Avoid Periods of High Temperature Can Efficiently Reduce Bacterial Wilt Disease Incidence with Tomato. *PLoS ONE* 10(10): e0139313.
30. **韦中**; 徐春淼; 郑海平; 廖汉鹏; 王世梅; 沈其荣; 徐阳春. “挂壁”法筛选常温稻秆腐解菌及其降解能力研究. *农业环境科学学报*, 2015, 10: 2027-2031.
31. **Zhong Wei**· Tianjie Yang· Ville Petri Friman· Yangchun XU· Qirong SHEN· Alexandre Jousset. Trophic network architecture of root-associated bacterial communities determines pathogen invasion and plant health. **Nature communications**. 2015 6:8413 | DOI: 10.1038/ncomms9413.
32. Liao, Hanpeng; Zheng, Haiping; Li, Shuixian; **Wei, Zhong**; Mei, Xinlan; Ma, Hongyu; Shen, Qirong; \*Xu, Yangchun. Functional diversity and properties of multiple xylanases from *Penicillium oxalicum* GZ-2. **Scientific Reports**, 2015, 5: 12631.
33. **Zhong Wei**· Jianfeng HUANG· Chunlan YANG· Yangchun XU· Qirong SHEN· Wei CHEN. Screening of suitable carriers for *Bacillus amyloliquefaciens* strain QL-18 to enhance the biocontrol of tomato bacterial wilt. **Crop Protection**, 2015, 75: 96-103.
34. Hanpeng Liao; XiaoTeng Fan; Xinlan Mei; **Zhong Wei**; Waseem Raza; Qirong Shen; Yangchun Xu. Production and characterization of cellulolytic enzyme from *Penicillium oxalicum* GZ-2 and its application in lignocellulose saccharification. **Biomass and Bioenergy**, 2015, 74:122-134.
35. Cai, Feng; Chen, Wei; **Wei, Zhong**; Pang, Guan; Li, Ruixia; Ran, Wei; \*Shen, Qirong. Colonization of *Trichoderma harzianum* strain SQR-T037 on

- tomato roots and its relationship to plant growth, nutrient availability and soil microflora. **Plant and Soil**, 2015, 388(1-2): 337-350.
36. 徐春淼; 韦中; 廖汉鹏; 樊晓腾; 郑海平; 沈其荣; 徐阳春. 一种评价稻秆降解菌分解能力的方法. **南京农业大学学报**, 2015, 3: 417-423.
37. Muhammad Faheem; Waseem Raza; **Wei Zhong**; Zhang Nan; Qirong Shen; Yangchun Xu. Evaluation of the biocontrol potential of *Streptomyces goshikiensis* YCXU against *Fusarium oxysporum* f. sp. *niveum*. **Biological Control**, 81: 101-110.
38. 韦中, 胡洁, 董月, 杨天杰, 沈其荣, 徐阳春. 基于菜粕有机肥筛选番茄青枯病高效生防菌的研究. **南京农业大学学报**. 2015, 38(3): 424-430
39. Liao, Hanpeng; Li, Shuixian; **Wei, Zhong**; Shen, Qirong; \*Xu, Yangchun. Insights into high-efficiency lignocellulolytic enzyme production by *Penicillium oxalicum* GZ-2 induced by a complex substrate. **Biotechnology for Biofuels**, 2014, 7:162, 2014/11/18.
40. Huang, Jianfeng; **Wei, Zhong**; Tan, Shiyong; Mei, Xinlan; Shen, Qirong; \*Xu, Yangchun. Suppression of Bacterial Wilt of Tomato by Bioorganic Fertilizer Made from the Antibacterial Compound Producing Strain *Bacillus amyloliquefaciens* HR62. **Journal of Agricultural and Food Chemistry**, 62(44): 10708-10716.
41. Liao, Hanpeng; Li, Shuixian; Zheng, Haiping; **Wei, Zhong**; Liu, Dongyang; Raza, Waseem; Shen, Qirong; \*Xu, Yangchun. A new acidophilic thermostable endo-1,4-beta-mannanase from *Penicillium oxalicum* GZ-2: cloning, characterization and functional expression in *Pichia pastoris*. **BMC Biotechnology**, 2014, 14:90.
42. Liao, Hanpeng; Sun, Shaowei; Wang, Pan; Bi, Wenli; Tan, Shiyong; **Wei, Zhong**; Mei, Xinlan; Liu, Dongyang; Raza, Waseem; Shen, Qirong; \*Xu, Yangchun. A new acidophilic endo-beta-1,4-xylanase from *Penicillium oxalicum*: cloning, purification, and insights into the influence of metal ions on xylanase activity. **Journal of Industrial Microbiology and Biotechnology**, 41(7): 1071-1083, 2014/7.
43. 张小兰, 韦中, 梅新兰, 沈其荣, 徐阳春. 一种基于根际定殖能力筛选溶磷菌的方法. **南京农业大学学报**, 2014, 37(2): 79-84.
44. 陈毛华, 韦中, 徐阳春. 蚓粪配合不同堆肥对不结球白菜育苗及生长的影响. **南京农业大学学报**, 2014, 37(2): 73-78.



45. Feng Cai, Guanghui Yu, Ping Wang, **Zhong Wei**, Lin Fu, Qirong Shen, Wei Chen\*. Harzianolide, a novel plant growth regulator and systemic resistance elicitor from *Trichoderma harzianum*. *Plant Physiology and Biochemistry*. 2013, 73: 106-113.
46. Jianfeng Huang, **Zhong Wei**, Shiyong Tan, Xinlan Mei, Shixue Yin, Qirong Shen, Yangchun Xu. The rhizosphere soil of diseased tomato plants as a source for novel microorganisms to control bacterial wilt. **Applied Soil Ecology**, 2013, 72: 79-84.
47. Zhen Zhu, Fengge Zhang, **Zhong Wei**, Wei Ran, Qirong Shen. The usage of rice straw as a major substrate for the production of surfactin by *Bacillus amyloliquefaciens* XZ-173 in solid-state fermentation. *Journal of Environmental Management*, 2013, 127: 96-102.
48. 张鹏, **韦中**, 朱震, 高雪莲, 邓开英, 冉炜\*, 沈其荣. 生物有机肥对连作番茄和辣椒根际土壤微生物区系及茄科雷尔氏菌的影响. *南京农业大学学报*, 2013, 36 (4):77-82.
49. **Zhong Wei**, Jianfeng Huang, Shiyong Tan, Xinlan Mei, Qirong Shen, Yangchun Xu. The congeneric strain *Ralstonia pickettii* QL-A6 of *Ralstonia solanacearum* as an effective biocontrol agent for bacterial wilt of tomato. **Biological Control**, 2013, 65: 278-285.
50. 王永和, **韦中**, 郁洁, 徐阳春. 适宜戈壁荒漠地区的番茄栽培基质. *江苏农业学报*, 2013, 29(6): 1333-1338.
51. Hanpeng Liao, Chunmiao Xu, Shiyong Tan, **Zhong Wei**, Ning Ling, Guanghui Yu, Waseem Raza, Ruifu Zhang, Qirong Shen, Yangchun Xu. Production and characterization of acidophilic xylanolytic enzymes from *Penicillium oxalicum* GZ-2. **Bioresource Technology**, 2012, 123: 117-124.
52. **Zhong Wei**, Xingming Yang, Shixue Yin, Qirong Shen, Wei Ran, Yangchun Xu. Efficacy of Bacillus-fortified organic fertiliser in controlling bacterial wilt of tomato in the field. **Applied Soil Ecology**, 2011, 48(2):152-159.

## 六、专利成果

### 已授权专利

1. 沈其荣, **韦中**, 徐阳春, 杨兴明, 沈标. 2010-10-06. 防除连作番茄青枯病的拮抗菌及其微生物有机肥料, 中国发明专利, 专利授权号: ZL200910182260.9.
2. 沈其荣, **韦中**, 徐阳春, 黄建凤, 杨兴明. 2012-11-19. 一种能防治番茄

青枯病的微生物疫苗，中国发明专利，专利授权号：ZL201210466659.7. 授权时间2015.4.15

3. 徐阳春，**韦中**，胡洁，亚历山大·如赛. 2013-12-22. 一株嗜热地芽孢杆菌NJRC-14及其微生物有机肥料，授权号号：ZL201310662410.8. 授权时间2015.8.26
4. 徐阳春，樊晓腾，**韦中**，沈其荣. 2014-05-29. 一种加速玉米秸秆还田腐解的方法. 授权号：ZL201410233987.1. 授权时间2016.3.2.
5. 徐阳春，张乃文，**韦中**，沈其荣. 2014-05-27. 一株梨树枝条降解真菌及其菌剂. 授权号：ZL201410228275.0. 授权时间2016.5.5.
6. 徐阳春，徐春森，**韦中**，沈其荣. 2014-05-27. 一株水稻秸秆降解真菌拟康宁木霉ZJC-1及其菌剂. 授权号：ZL201410229566.X. 授权时间2016.6.8.
7. 徐阳春，沈大春，**韦中**，沈其荣. 2016-04-06. 一株降解秸秆的复配菌剂FX及其应用. 授权号：ZL201610211876.1. 授权时间2019.2.19.
8. 徐阳春，**韦中**，谷益安，沈其荣. 一种非破坏性连续采集根际土的根盒. 2018-09-17，江苏，（中国专利局），实用新型专利，授权号：ZL201822078995.X. 授权时间2019.9.17.

#### 在受理专利

9. 王世梅；沈婷；王辰；徐阳春；沈标；**韦中**；沈其荣. 一种防控连作草莓根腐病的拮抗放线菌及其生防制剂的制备方法. 2014-12-09，江苏，（中国专利局），申请号：CN201410749393.6.
10. **韦中**，侯玉刚，**王孝芳**，徐阳春，沈其荣. 一株具有防控番茄青枯病的裂解性噬菌体及其用途. 2018-04-26，江苏，（中国专利局），申请号：CN 201810386182.9
11. **韦中**，**王孝芳**，王佳宁，徐阳春，沈其荣. 一株防治土传青枯病的噬菌体及其应用. 2018-04-07，江苏，（中国专利局），申请号：CN 201810362276.2.
12. **韦中**，**王孝芳**，杨可铭，徐阳春，沈其荣. 一种噬菌体鸡尾酒及其应用. 2018-04-20，江苏，（中国专利局），申请号：CN 201810375733.1
13. 徐阳春，**韦中**，浩折霞，杨清俊，沈其荣. 一种功能性复合微生物育苗基质及其制备方法与应用. 2018-04-26，江苏，（中国专利局），申请号：CN 201810385573.0.
14. 徐阳春，**韦中**，**王孝芳**，黄大鹏，沈其荣. 一种生物质炭与生防菌联合防控番茄土传青枯病的方法. 2018-04-13，江苏，（中国专利局），申请号：CN 201810330756.0.

15. 徐阳春, 韦中, 窦亮, 沈其荣. 一种功能性育苗基质及其应用. 2018-09-17, 江苏, ( 中国专利局 ), 申请号: CN 201811080699. 1.
16. 徐阳春, 暴炎灼, 万金鑫, 韦中, 沈其荣. 一株低温秸秆降解真菌JGDW-1及其菌剂与应用. 2018-09-17, 江苏, ( 中国专利局 ), 申请号: CN 201811197966. 3.
17. 薛卫 ; 胡雪娇 ; 徐阳春 ; 韦中 ; 梅新兰 ; 陈行健. 非接触式罐装堆肥腐熟判断方法, 江苏, ( 中国专利局 ), 申请号: CN201810379431. 1.
18. 薛卫 ; 胡雪娇 ; 徐阳春 ; 韦中 ; 梅新兰 ; 陈行健. 基于深度学习网络的堆肥腐熟实时预测方法, 江苏, ( 中国专利局 ), 申请号: CN201810379431. 1.
19. 徐阳春, 暴炎灼, 万金鑫, 韦中, 沈其荣. 一株高温秸秆降解细菌B-8及其菌剂与应用, 江苏, ( 中国专利局 ), 2019. 5. 23, 申请号: CN 201910433174. X