

Chen Jinfeng



Areas of Research

Cucurbit genetics, evolution and breeding.

Contact Information

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Research Interests

We mainly research the interspecific hybridization and genetic breeding of melon vegetable crops, cell molecular genetics and germplasm innovation, and the improvement of cultivated cucumber varieties:

(1) Rediscovered the rare wild species of Cucumber (*Cucumis hystrix* Chakr., $2n=24$) and proved the special biological system relationship between it and cultivated cucumber (*C. sativus* L., $2n=14$), and won the first place A cucumber interspecific hybrid;

(2) A new diploid species of the genus Muskmelon was synthesized, named *Cucumis ×hytivus* Chen and Kirkbride, and an important breakthrough in interspecific hybridization and genetic breeding of Cucumber crops was made;

(3) Created a series of cucumber-specific cell breeding germplasm, including "allogeneic triploids" ($2n=26$), "cucumber monomer alloaddition lines" ($2n=15$), "heterologous translocation lines" and so on.

Education Background

Bachelor: Southwest Agricultural University

Master: Southwest Agricultural University

Doctor: Southwest Agricultural University

Work experience

2003-2006, "Tang Scholar", Cornell University, USA

2000-now, Professor, Nanjing Agricultural University, China

1997-1999, Assistant Professor, Clemson University, USA

1995-1996, Visiting Scientist, Saga University, Japan

1987-1988, Advanced study at the Department of Genetic Engineering, Fudan University, China

Honors and Awards

Secretary of the Party Committee of the College of Horticulture, Nanjing Agricultural University

Member of the Academic Committee of Nanjing Agricultural University. The backbone member of the "State Key Laboratory of Crop Genetics and Germplasm Innovation"

Deputy Director of "Key Laboratory of Southern Vegetable Genetic Improvement, Ministry of Agriculture"

Associate editor of the journal "Chinese Melon and Vegetables"

editor of the university textbook "Plant Tissue Culture"

chief teacher of "National Bilingual Demonstration Course"

"Special Government Allowance", "China Youth Science and Technology Award", "Shennong China Agricultural Science and Technology Award", State Council of China "Young and Middle-aged Experts with Outstanding Contributions", "Experts in Senior Expert Database" Ministry of Agriculture of China

"Cross-century Outstanding Talents" Ministry of Education,

"Expert Review Group Experts" National Natural Science Foundation of China,

"Down Scholars" Cornell University,

"Six Talent Peaks" training target Jiangsu Province

Research projects (partial):

(1) In-depth discovery of important disease-resistant genes in wild cucumber species, pickled cucumber (NSFC, 31430075)

(2) Research and demonstration of key technologies for high-yield and high-efficiency of facility vegetables in the Yangtze River Delta (Special Research Project for Public Welfare Industries (Agriculture), 201403032)

(3) Molecular genetics and regulatory mechanisms of cucumber and tomato fruit formation (973 Program, 2012CB113904)

(4) Research on vegetable cell breeding technology and creation of excellent germplasm (863 Program, 2012AA100102)

(5) Molecular marker gene analysis and cold tolerance of cucumber parthenocarpic (973 plan, 2009CB119001)

(6) The regulatory mechanism of mitochondrial disappearance in maternal cucumber (NSFC, 31071801)

(7) Discovery of excellent wild genes in Muskmelon based on interspecific introgression (NSFC, 30830079)

(8) Fine mapping of QTL for cucumber carotenoid content and cloning of related regulatory genes (NSFC, 30972007)

(9) Wild resistance of Muskmelon based on Ty1-copia retrotransposon and interspecific introgression (Doctoral Fund, 20090097110024)

International cooperation projects: establish long-term cooperation with international companies such as Limagrain, Syngenta, Nunhems, PPI (Pickle Packer International), etc.

Invention patent (partial):

1. 2020 cucumber parthenocarpy main effect QTL Parth2.1 linked molecular marker and its application ZL201910605499.1

2. The breeding method and application of new varieties of cucumber interspecific hybrids with patented downy mildew resistance in 2019 ZL201811487242.2

3. Chromosome physical location method of cucumber single-copy gene in 2017 ZL201310409784.9

4. 2016 Cucumber pollen semi-thin section MTG-DAPI double staining to observe mitochondrial DNA ZL201310396467.8

5. In 2013, the breeding method of cucumber introgression line materials resistant to southern root knot nematode ZL20111023037.X

6. The SSR marker ZL201110081073.4 of the muskmelon resistance gene GSB-4 in 2012

7. The breeding method and application of the all-female North China cucumber Nanni No. 1 in 2012 ZL200910262845.7

8. 2012 Cultivation and Application of All-female American Slice Cucumber 09 ZL201010017674.4

9. 2012 Cultivation and application of all-female processing cucumber Youjia All-female 09 ZL201010017675.9

10. In 2012, the cultivation and application of the all-female North China cucumber Huabei all-female No. 2 ZL201010017672.5

11. In 2012, the cultivation and application of all-female South China cucumbers and all-female South China 09 ZL201110107676.3

12. In 2012, the breeding method of allotriploid Cucumbers of the genus Muskmelon ZL201110107687.5

13. Cultivation method of free microspores of cucumber in 2010 ZL200810022098.5

14. 2010 Patent Certificate ZL20071002553 for Muskmelon Resistance Gene Locus

Cultivate new varieties:

"Ningyun No. 3" Supermarket Cucumber

"Nanshui No. 2" Cucumber for Fruit Type Facility Cultivation

"Ningjia No. 7" processed cucumber

"Nankang No. 1" dense thorn cucumber

Selected Publication

1. Xiaqing Yu, Zaobing Zhu, Ting Zhang, Ji Li, Chunyan Cheng, Qunfeng Lou, C.-O. Ottosen, Jinfeng Chen*. High-throughput sequencing reveals change of microRNA expression caused by allopolyploidization in Cucumis. *Biologia plantarum*.2020,64:104-109.
2. Ying Deng, Bing Tang, Xia Zhou, Wenyuan Fu, Lian Tao, Lu Zhang, Jinfeng Chen*. Direct regeneration of haploid or doubled haploid plantlets incucumber (*Cucumis sativus* L.) through ovary culture. *Plant Cell Tissue and Organ Culture(PCTOC)*.2020,142:253-268.
3. MartinKagiki Njogu, Fan Yang, Ji Li, Xueyan Wang, Joshua Otieno Ogwen*, Jinfeng Chen*. A novel mutation in TFL1 homolog sustaining determinate growth in cucumber(*Cucumis sativus* L.). *Theoretical and Applied Genetics*. <https://doi.org/10.1007/s00122-020-03671-4>.
4. Cheng Chunyan, Li Qingrong, Wang Xing, Li Ying, Qian Chuntao, Li Ji, Lou Qunfeng, Chen Jinfeng*, John Molly*. Identification and expression analysis of the CsMYB gene family in Root Knot Nematode-resistant and susceptible cucumbers. *Frontier in Genetics* . doi: 10.3389/fgene.2020.550677.
5. Qinzhen Zhao, Yunzhu Wang, Yunfei Bi, Yufei Zhai, Xiaqing Yu, Chunyan Cheng, Panqiao Wang, Ji Li, Qunfeng Lou*, Jinfeng Chen*. Oligo-painting and GISH reveal meiotic chromosome biases and increased meiotic stability in synthetic allotetraploid *Cucumisxhytivus* with dysploid parental karyotypes. *BMC Plant Biology*,2019, 19:471. <https://doi.org/10.1186/s12870-019-2060-z>.
6. Yunfei Bi†, Qinzhen Zhao†, Wenkai Yan†, Mengxue Li, Yuxi Liu, Chunyan Cheng, Lu Zhang, Xiaqing Yu, Ji Li, Chuntao Qian, Yufeng Wu, Jinfeng Chen*, Qunfeng Lou*. Flexible chromosome painting based on multiplex PCR of oligonucleotides and its application for comparative chromosome analyses in Cucumis. *The Plant Journal*, 2019, doi: 10.1111/tpj.14600.
7. Mengfei Song†, Feng Cheng†, Jing Wang, Qingzhen Wei, Wenjuan Fu, Xiaqing Yu, Ji Li, Jinfeng Chen*, Qunfeng Lou*.A leaf shape mutant provides insight into PINOID Serine/Threonine Kinase function in cucumber (*Cucumis sativus* L.). *Journal of Integrative Plant Biology*,2019, 61(9): 1000-1014.
8. Mengfei Song, MengRu Zhang, Feng Cheng, Qingzhen Wei, Jing Wang, Marzieh Davoudi, Jinfeng Chen*, Qunfeng Lou*.An irregularly striped rind mutant reveals new insight into the function of PG1 β in cucumber (*Cucumis sativus* L.). *Theoretical and Applied Genetics*, <http://doi.org/10.1007/s00122-019-03468-0>.
9. Yufei Zhai, Xiaqing Yu, Zaobing Zhu, Panqiao Wang, Ya Meng, Qinzhen Zhao, Ji Li, Jinfeng Chen*. Nuclear-Cytoplasmic Coevolution Analysis of RuBisCO in Synthesized Cucumis Allopolyploid. *Genes*. 2019, 10, 869.

10. Kaijing Zhang, Yifan Wei, Martin Kagiki Njogu, Xing Wang, Qunfeng Lou, Ji Li*, Jinfeng Chen*. Genetic mapping of angular leaf spot resistance to *Pseudomonas syringae* pv. *lachrymans* in a *Cucumis hystrix* introgression line of cucumber. *Euphytica*, 2019,215:176.
11. Shuqiong Yang, Chunyan Cheng, Xiaodong Qin, Xiaqing Yu, Qunfeng Lou, Ji Li, Chuntao Qian, Jinfeng Chen*. Comparative cyto-molecular analysis of repetitive DNA provides insights into the differential genome structure and evolution of five *Cucumis* species. *Horticultural Plant Journal*, 2019,5 (5): 192-204.
12. Chunyan Cheng, Xing Wang, Xuejiao Liu, Shuqiong Yang, Xiaqing Yu, Chuntao Qian, Ji Li, Qunfeng Lou, Jinfeng Chen*. Candidate genes underlying the quantitative trait loci for root-knot nematode resistance in *Cucumis hystrix* introgression line of cucumber based on population sequencing. *Journal of Plant Research*, 2019, 132: 813-823.
13. Xiaqing Yu, Xixi Wang, Benita Hyldgaard, Zaobing Zhu, Rong Zhou, Katrine Heinsvig Kjaer, Theoharis Ouzounis, Qunfeng Lou, Ji Li, Qingsheng Cai, Eva Rosenqvist, Carl-Otto Ottosen, and Jinfeng Chen*. Allopolyploidization in *Cucumis* contributes to delayed leaf maturation with repression of redundant homoeologous genes. *The Plant Journal*. 2018,94, 93-404.
14. Mengfei Song, Qingzhen Wei, Jing Wang, Wenyuan Fu, Xiaodong Qin, Xiumei Lu, Feng Cheng, Yang Yang, Lu Zhang, Xiaqing Yu, Ji Li, Jinfeng Chen*, and Qunfeng Lou*. Fine Mapping of CsVYL, Conferring Virescent Leaf Through the Regulation of Chloroplast Development in Cucumber. *FRONT PLANT SCI*. 2018, 9.
15. Xing Wang, Chunyan Cheng, Kaijing Zhang, Zhen Tian, Jian Xu, Shuqiong Yang, Qunfeng Lou, Ji Li* and Jinfeng Chen*. Comparative transcriptomics reveals suppressed expression of genes related to auxin and the cell cycle contributes to the resistance of cucumber against *Meloidogyne incognita*. *BMC GENOMICS*. 2018,19, 583.
16. Kaijing Zhang, Xing Wang, Wenwei Zhu, Xiaodong Qin, Jian Xu, Chuanyan Cheng, Qunfeng Lou, Ji Li* and Jinfeng Chen*. Complete resistance to powdery mildew and partial resistance to downy mildew in a *Cucumis hystrix* introgression line of cucumber were controlled by a co-localized locus. *THEOR APPL GENET*. 2018, 131, 2229-2243.
17. Ziang Li, Yunfei Bi, Xing Wang, Yunzhu Wang, Shuqiong Yang, Zhentao Zhang, Jinfeng Chen, and Qunfeng Lou*. Chromosome identification in *Cucumis anguria* revealed by cross-species single-copy gene FISH. *GENOME*. 2018,61, 397-404.
18. Shuqiong Yang, Xiaodong Qin, Chunyan Cheng, Ziang Li, Qunfeng Lou, Ji Li, Jinfeng Chen*. Organization and evolution of four differentially amplified tandem repeats in the *Cucumis hystrix* genome. *Planta*, 2017,246:749-761.
19. Jian Xu†, Ji Li†, Li Cui, Ting Zhang, Zhe Wu, Pin-Yu Zhu, Yong-Jiao Meng, Kai-Jing Zhang, Xia-Qing Yu, Qun-Feng Lou and Jin-Feng Chen*. New insights into the

roles of cucumber TIR1 homologs and miR393 in regulating fruit/seed set development and leaf morphogenesis. *BMC Plant Biology*, 2017, 17:130.

20. Yunzhu Wang, Zhentao Zhang, Ji Li, Qunfeng Lou* and Jinfeng Chen*. Molecular cytogenetic analysis provides evidence of introgression of chromosomal segments from the wild *Cucumis hystrix* into cultivated cucumber through the bridge of a synthetic allotetraploid. *Molecular breeding*, 2017, 37: 89.

21. Ning Zhang, Bing-hua Xu, Yan-fei Bi, Qun-feng Lou, Jin-feng Chen, Chun-tao Qian*, Yong-bing Zhang and Hong-ping Yi. Development of a Muskmelon Cultivar with Improved Resistance to Gummy Stem Blight and Desired Agronomic Traits Using Gene Pyramiding. *Czech J. Genet. Plant Breed.*, 53, 2017 (1): 23-29.

22. Yunzhu Wang, Qin-zheng Zhao, Zi-ang Li, Ji Li, Qun-feng Lou and Jin-feng Chen*. Identification of all homoeologous chromosomes of newly synthetic allotetraploid *Cucumis* × *hytivus* and its wild parent reveals stable subgenome structure. *Chromosoma*. 2017, 126:713-728

Reference

<http://chenlab.njau.edu.cn/default.asp>