XIAOTONG ZHANG

Research Assistant

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EDUCATION

Sun Yat-sen University, Guangzhou, China 2017-2020
MSc in Ecology
GPA: 3.87/4.00, top 5%
Thesis: "Global Distribution and Genomic Inference of the Metabolism of the Class *Tepidiformia* in the Phylum *Chloroflexi*"
Advisor: Wen-Jun Li, Fangliang He (co-supervisor)

Sun Yat-sen University, Guangzhou, China 2013-2017
BSc in Ecology
GPA: 3.8/4.0
Thesis: "Microbial Communities in Guizhou Karst Caves Based on Next-Generation Sequencing"
Advisor: Wen-Jun Li

APPOINTMENTS

Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China 2020-present
Research Assistant, *Shenzhen Institute of Synthetic Biology*
Advisor: Xue-Fei Li

SKILLS

Experimental skills - bacterial isolation, cultivation, identification, preservation
Bioinformatics - metagenomic and 16S rRNA gene amplicon sequencing data analysis
Python, R, MATLAB - file management, data processing, figure generation, web crawler
Linux - laboratory server administrator
Image analysis - image pre-processing, cell segregation, cell tracking
Modeling - individual-based modeling, reaction-diffusion model

RESEARCH INTERESTS

I am interested in combining experimental observations with mathematical modeling to study microbial community dynamics and interactions between microbes, hoping to find some simple rules in the complex world.

Particularly, I want to simulate and predict the microbial community dynamics under specific conditions based on empirical data and theoretical mechanisms. I am also interested in many other fields in microbial ecology, systems biology, and quantitative biology, such as microbial community assembly mechanism, microbial cross-feeding, bacterial predator-prey coevolution, microbial eco-evolutionary dynamics, plant-soil feedback, and so on.

RESEARCH EXPERIENCE

Computational modeling of cellular interactions in the tumor microenvironment 2020.08-present
Shenzhen Institutes of Advanced Technology, Guangzhou, China
Advisor: Xue-Fei Li

- Simulated the interactions between immune cells and bacteria in the tumor microenvironment by individual-based modeling in 2D
- Simulated the cellular interactions based on the reaction-diffusion model in 1D

Transmission dynamics of the COVID-19 Delta variant in Yangzhou, China 2021.08-present
Shenzhen Institutes of Advanced Technology, Guangzhou, China
Advisor: Xue-Fei Li

- Collected and inferred epidemiological information of 555 cases infected with the delta variant, such as infection date, confirmed date, close contacts, etc.
- Epidemiological analysis of the delta variant outbreak, like estimating the incubation period using interval-censored data maximum likelihood estimation
- Estimated the effectiveness of control measures

Tracking cells in PDMS microfluidic chips in phase-contrast images 2021.03-2021.08
Shenzhen Institutes of Advanced Technology, Guangzhou, China
Advisor: Xue-Fei Li, Xiongfei Fu

- Detected cells in phase-contrast microscopy images with chip noise
- Generated cell trajectories by linking short track segments into long trajectories under the limitation of the microchannel shape

Microbial Ecology 2016.09-2020.09
Sun Yat-sen University, Guangzhou, China
Advisor: Wen-Jun Li

- Investigated the global distribution and ecological functions of the class *Tepidiformia* in the phylum *Chloroflexi*
- Interpreted the microbial community structure in karst caves using 16S rRNA gene amplicon sequencing data
- Screened cellulase genes from metagenomic data of hot spring samples enriched on cellulose

Microbial Resources & Systematics 2016.09-2019.09
Sun Yat-sen University, Guangzhou, China
Advisor: Wen-Jun Li

- Updated the classification of higher ranks in the phylum *Actinobacteria*
- Reclassified species in the genus *Nocardiopsis*
- Cultivated *Chloroflexi* bacteria using culture filtrates of a *Proteobacteria* bacterium, which can facilitate the growth of some *Chloroflexi* bacteria
- Isolated and preserved 177 strains from saline-alkali soil samples. Based on 16S rRNA gene sequence similarities, 11 strains are potential novel candidate species

PUBLICATIONS

[1] **Zhang, X.-T.***, Salam, N.*, Xiao, M., Asem, M.D., and Li, W.-J. (2020). Genome analysis reveals that *Nocardiopsis baichengensis* Li et al. 2006 is a later heterotypic synonym of *Nocardiopsis halophila* Al-Tai and Ruan 1994. *International Journal of Systematic and Evolutionary Microbiology*, 70(1): 89-92. https://doi.org/10.1099/ijsem.0.003721
(Collected and analyzed the genomic data, constructed the phylogenetic tree and created its corresponding figure, wrote part of the paper.)

[2] Salam, N.*, Jiao, J.-Y.*, **Zhang, X.-T.***, & Li, W.-J. (2020). Update on classification of higher ranks in the phylum *Actinobacteria*. *International journal of systematic and evolutionary microbiology*, 70(2): 1331-1355. https://doi.org/10.1099/ijsem.0.003920
(Collected 16S rRNA gene sequences and part of the genomic data, constructed phylogenetic trees, created all the figures.)

[3] Li, X.*, Li, J.-L.*, **Zhang, X.-T**.*, Duan, L., Asem, M.D., Xiao, M., Mou, X., Salam, N., and Li, W.-J. (2019). *Aestuariisphingobium litorale* gen. nov., sp. nov., a novel proteobacterium isolated from a water sample of Pearl River estuary. *Antonie van Leeuwenhoek*, 112(9): 1357-1367. https://doi.org/10.1007/s10482-019-01268-6
(Collected and analyzed genome sequences, predicted marker genes, constructed concatenated protein phylogenetic tree, computed the average amino acid identity.)

[4] Xian, W.-D., **Zhang, X.-T.**, Li, W.-J. (2020). Research status and prospect on bacterial phylum *Chloroflexi*. *Acta Microbiologica Sinica*, 60(9): 1801–1820. https://doi.org/10.13343/j.cnki.wsxb.20200463
(Wrote the paper.)

[5] Xian, W.-D. *, Li, M.-M. *, Salam, N. *, Zhou, E.-M., Yin, Y.-R., Liu, Z.-T., Ming, Y.-Z., **Zhang, X.-T.**, Wu, G., Liu, L., Xiao, M., Jiang, H.-C., Li, W.-J. (2020). Network-directed efficient isolation of previously uncultivated *Chloroflexi* and related bacteria in hot spring microbial mats. *npj Biofilms and Microbiomes*, 6(1): 1-10. https://doi.org/10.1038/s41522-020-0131-4
(Analyzed 16S rRNA gene amplicon sequencing data.)

[6] Jiao, J.-Y., Salam, N., Liu, L., Rao, M.P.N., **Zhang, X.-T.**, Fang, B.-Z., Han, M.-X., Zhang, Z.-T., Chen, J., Zhao, J., et al. (2018). Genome sequence and comparative analysis of *Jiangella alba* YIM 61503^{T} isolated from a medicinal plant *Maytenus austroyunnanensis*. *Antonie van Leeuwenhoek*, 111(5): 667-678. https://doi.org/10.1007/s10482-017-1010-8
(Analyzed secondary metabolite biosynthesis gene clusters.)

FIELD & LABORATORY EXPERIENCES

Undergraduate researcher **Prof. Wen-Jun Li** 2016.09-2017.06
Microbial Resources - Bacterial cultivation, identification
Microbial Ecology - 16S rRNA gene amplicon sequencing analysis

Undergraduate researcher **Prof. Shixiao Yu** 2016.03-2016.06
Janzen-Connell Hypothesis - Fungal isolation and cultivation

Sun Yat-sen University undergraduate innovation training project **Prof. Xubing Liu** 2015.07-2015.08
Ecological Restoration - Plant and animal diversity investigation of introduced mangrove communities in the Dongzhai Port Nature Reserve

Undergraduate researcher **Prof. Suqin Fang** 2014.10-2015.06
Root Behavior - Plant root cultivation and image capture in a transparent system

Series of experimental skills course **Prof. Xubing Liu** 2014.09

Field Experiment - Effects of phylogenetic diversity on ecosystem functioning

Volunteer **Prof. Wenbo Liao** 2014.07

Field Survey - Plant diversity investigation in the Jinggang Mountains

SCHOLARSHIPS & AWARDS

Outstanding Graduate Student Award (Sun Yat-sen University) (top 5% of the graduates)	2020.07
First Class Fellowship for Master's Students (Sun Yat-sen University)	2019-2020
First Class Fellowship for Master's Students (Sun Yat-sen University)	2018-2019
First Class Fellowship for Master's Students (Sun Yat-sen University)	2017-2018
Second Class Undergraduate Scholarship (Sun Yat-sen University)	2015-2016
Gold Prize in China College Students' Entrepreneurship Competition - Public Welfare Contest	2014.11
Third Class Undergraduate Scholarship (Sun Yat-sen University)	2014-2015

REFERENCES

Xue-Fei Li
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Relationship: Research supervisor. I am his research assistant.

Wen-Jun Li
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Relationship: Master's supervisor

Fangliang He
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Relationship: Master's co-supervisor & professor