

Jingqiu (Celia) Liao

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Research Interests

Microbial evolution and ecology / Microbial biogeography / Environmental microbiology / Evolutionary and ecological genomics / Population genetics / Population genomics / Comparative genomics / Foodborne pathogens

Education

Ph.D. Candidate, Microbiology

CORNELL UNIVERSITY

2015-2020

Ithaca, NY, US

- Major advisor: Martin Wiedmann, Department of Food Science
- Minor advisors: Michael Stanhope (Genomics); Daniel Buckley (Soil Science)

Ph.D. exchange student, Microbiology

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Fall 2019

Cambridge, MA, US

- Advisor: Otto Cordero, Department of Civil and Environmental Engineering

M.S., Environmental Sciences

PEKING UNIVERSITY

2011-2014

Beijing, China

- Advisor: Yi Huang, Department of Environmental Sciences

B.S., Ecology

UNIVERSITY OF SCIENCE & TECHNOLOGY BEIJING

2007-2011

Beijing, China

Research Experience

Graduate Research Associate

FIELD OF MICROBIOLOGY, CORNELL UNIVERSITY

2016-Current

Ithaca, NY, US

- Led projects (i) *Listeria whole genome sequence reference sets for improved persistence assessment and source tracking*, (ii) *Microevolution of antimicrobial-resistant Salmonella enterica*, and (iii) *Influence of landscape on distribution of E. coli in watershed*.
- Involved in projects (i) *New Listeria species characterization*, (ii) *Development of mathematical models for developing environmental sampling programs for Listeria and assess L. monocytogenes-associated public health risks in the frozen food industry*.

Research Associate

DEPARTMENT OF ENVIRONMENTAL SCIENCES, PEKING UNIVERSITY

2014-2015

Beijing, China

- Led project *Biogeography and assembly of bacterial communities in lakes on Yungui Plateau, China*.
- Involved in project *Structure of bacterial community in lake sediment*.

Graduate Research Assistant

DEPARTMENT OF ENVIRONMENTAL SCIENCES, PEKING UNIVERSITY

2011-2014

Beijing, China

- Involved in projects (i) *Toxicity and ecology of oil contaminated soil in oil fields of China*, (ii) *Global Environment Outlook 5*, and (iii) *Regionalization of Dianchi Basin, China*.

Publications

PREPRINT

- [1] **Liao J**, Bergholz P, Wiedmann M. Terrestrial landscape impacts the biogeographic pattern of soil *Escherichia coli* via altering the strength of environmental selection and dispersal. bioRxiv doi:10.1101/2020.06.30.181495

PEER-REVIEWED

- [1] Meeske AJ, Jia N, Cassel AK, Kozlova A, **Liao J**, Wiedmann M, Patel DJ, Marraffini LA. A phage-encoded anti-CRISPR enables complete evasion of type VI-A CRISPR-Cas immunity. *Science* 369:54-59

- [2] **Liao J**, Orsi RH, Carroll LM, Wiedmann M. Comparative genomics reveals different population structures associated with host and geographic origin in antimicrobial-resistant *Salmonella enterica*. *Environ Microbiol* 22:2811-2828
- [3] **Liao J**, Orsi RH, Carroll LM, Kovac J, Ou H, Zhang H, Wiedmann M. 2019. Serotype-specific evolutionary patterns of antimicrobial-resistant *Salmonella enterica*. *BMC Evol Biol* 19:132
- [4] Huang Y, Wang J, Chen H, **Liao J**, Huang M. Oil contamination and toxicity assessment of soil in main oil fields in China. Science Press, Beijing, China. June 2018 (Book in Chinese)
- [5] **Liao J**, Wiedmann M, Kovac J. 2017. Genetic stability and evolution of the *sigB* allele, used for *Listeria sensu stricto* subtyping and phylogenetic inference. *Appl Environ Microbiol* 83:e00306-17
- [6] **Liao J**, Cao X, Wang J, Zhao L, Sun J, Jiang D, Huang Y. 2017. Similar community assembly mechanisms underlie similar biogeography of rare and abundant bacteria in lakes on Yungui Plateau, China. *Limnol Oceanogr* 2:723-735
- [7] Cao X, Wang J, **Liao J**, Gao Z, Jiang D, Sun J, Zhao L, Huang Y, Luan S. 2016. Bacterioplankton communities response to key environmental variables in plateau freshwater lake ecosystems: a structural equation modeling analysis. *Sci Total Environ* 580:457-467
- [8] **Liao J**, Zhao L, Cao X, Sun J, Gao Z, Wang J, Jiang D, Fan H, Huang Y. 2016. *Cyanobacteria* in lakes on Yungui Plateau, China are assembled via niche processes driven by water physicochemical property, lake morphology and watershed land-use. *Sci Rep* 6:36357
- [9] **Liao J**, Cao X, Zhao L, Wang J, Gao Z, Wang MC, Huang Y. 2016. The importance of neutral and niche processes for bacterial community assembly differs between habitat generalists and specialists. *FEMS Microbiol Ecol* 92:fiw174
- [10] Wang J, Cao X, Chai L, **Liao J**, Huang Y, Tang X. 2016. Oxidative damage of naphthenic acids on the *Eisenia fetida* earthworm. *Environ Toxicol* 31:1337-1343
- [11] **Liao J**, Wang J, Jiang D, Wang M, Huang Y. 2015. Long-term oil contamination causes similar changes in microbial communities of two distinct soils. *Appl Microbiol Biotechnol* 99:10299-10310
- [12] **Liao J**, Wang J, Huang Y. 2015. Bacterial community features are shaped by geographic location, physicochemical properties and oil contamination of soil in main oil fields of China. *Microb Ecol* 70:380-389
- [13] Cao X, Wang, J, **Liao J**, Huang Y, Sun J. 2015. The threshold responses of phytoplankton community to nutrient gradient in a shallow eutrophic lake. *Ecol Indic* 61:258-267
- [14] Wang J, Cao X, Chai L, **Liao J**, Huang Y, Tang X. 2015. Quantification and characterization of naphthenic acids from soil of oil exploring areas in China by GC/MS. *Anal Methods* 7:2149-2154
- [15] Wang J, Cao X, **Liao J**, Huang Y, Tang X. 2015. Carcinogenic potential of PAHs in oil-contaminated soils from the main oil fields across China. *Environ Sci Pollut R* 22:10902-10909
- [16] Yang Y, Wang J, **Liao J**, Xie S, Huang Y. 2015. Abundance and diversity of soil petroleum hydrocarbon egrading microbial communities in oil exploring areas. *Appl Microbiol Biotechnol* 99:1935-1946
- [17] Yang Y, Wang J, **Liao J**, Xie S, Huang Y. 2014. Distribution of naphthalene dioxygenase genes in crude oil contaminated soils. *Microb Ecol* 68:785-793
- [18] **Liao J**, Huang Y. 2013. Global trend in aquatic ecosystem research from 1992 to 2011. *Scientometrics* 98:1203-1219

Presentations

Microbiology Graduate Seminar, Cornell University

ORAL PRESENTER

Feb., 2020

Ithaca, NY, US

- Biogeography of edaphic *Listeria* across the United States

Microbiome, Cold Spring Harbor Laboratory Meeting

POSTER PRESENTER

Jul., 2019

Cold Spring Harbor, NY, US

- Comparative genomics reveals different population structures associated with host and geographic origin in antimicrobial-resistant *Salmonella enterica*

Microbiology Graduate Seminar, Cornell University

ORAL PRESENTER

Mar., 2019

Ithaca, NY, US

- Nationwide distribution of *Listeria* in soil from natural environment

Biology of Genomes, Cold Spring Harbor Laboratory Meeting

POSTER PRESENTER

May, 2018

Cold Spring Harbor, NY, US

- Serotype-specific evolutionary pattern of antimicrobial-resistant *Salmonella enterica*.

Microbiology Graduate Seminar, Cornell University

ORAL PRESENTER

- Serotype-specific evolutionary pattern of antimicrobial-resistant *Salmonella enterica*

Apr., 2018

Ithaca, NY, US

Cornell University - Nestle Whole Genome Sequencing Training, Cornell University

ORAL PRESENTER

- Phylogenetic tree reconstruction.

Oct., 2017

Ithaca, NY, US

Ecological & Evolutionary Genomics, Gordon Research Conference

POSTER PRESENTER

- Genetic stability and evolution of the *sigB* allele used for *Listeria* subtyping and phylogenetic inference

Jul., 2017

Biddeford, ME, US

Microbiology Graduate Seminar, Cornell University

ORAL PRESENTER

- Genetic stability and evolution of *sigB* allele of *Listeria sensu stricto*

Mar., 2017

Ithaca, NY, US

M.S. Dissertation Seminar, Peking University

ORAL PRESENTER

- The physicochemical property and microbial structure of oil contaminated soils

Jun., 2014

Beijing, China

The 6th SNU-PKU-KU Environmental Workshop, Seoul National University

ORAL PRESENTER

- Conservation of Chinese ecosystems: strategy and challenge

Jul., 2012

Seoul, South Korea

The 6th TU-USTB Joint Meeting on Sciences & Engineering Design, Tohoku University

ORAL PRESENTER

- The influence of climate change on human ecology

Jul., 2010

Sendai, Japan

Professional Activities

Journal reviewer *Int Biodeterior Biodegradation* / *Scientometrics* / *Fund Appl Limnol* / *Ecotox Environ Safe* / *Mar Pollut Bull*

Topic editor *Frontiers in Water* (in progress)

Teaching and Mentoring Experience

Teaching assistant BioMi2900 General Microbiology, Cornell University

Spring 2018

Teaching assistant Environmental ecology, Peking University

Fall 2011

Mentor Yaoqian Hu, Peking University

2014-2015

Mentor Muke Huang, Peking University

2018-2019

Mentor Catharine Carlin; Cornell University

2019-2020

Skills

Biology Microbial isolation and culture / Molecular biology (DNA) / High-throughput sequencing / Field sampling

Bioinformatics Programming (Python, R) / Computational biology / Biostatistics

Languages English, Chinese

Leadership & Outreach

Social chair Field of Microbiology Students (FoMS), Cornell University

2017-2018

Volunteer 3M environmental sampling workshop, Cornell University

2016-2018

Student representative The 13th Annual Retreat of the Center for Infection & Pathobiology, Cornell University

Apr. 2017

Vice-captain PKUI Team, Solar Decathlon China

2012-2013

Vice-president College Student Union, Peking University

2012-2013

Vice-president College Student Union, University of Science & Technology Beijing

2009-2010

Volunteer Beijing Olympic Games

Summer 2008

Honors & Awards

Graduate Research Assistantship	Cornell University	2016-Current
Conference & Research Travel Grants	Cornell University	2017-2019
Cornell Graduate Fellowship	Cornell University	2015-2016
Graduate Research Assistantship	Peking University	2011-2014
Sander Scholarship	Peking University	2013
Academic Innovation Award	Peking University	2013
Honor Student for Excellent Academic Records	Peking University	2012
The 2nd Prize of Academic Innovation Contest	Peking University	2012
National Scholarship	China	2010
National Inspirational Scholarship	China	2009
Freshmen Scholarship	University of Science & Technology Beijing	2008
Student Innovation Program Scholarship	University of Science & Technology Beijing	2008