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 *2015-2020*

Cornell University *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 *Fall 2019*

Massachusetts Institute of Technology *Cambridge, MA, US*

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

M.S., Environmental Sciences *2011-2014*

Peking University *Beijing, China*

- Advisor: Yi Huang, Department of Environmental Sciences

B.S., Ecology *2007-2011*

University of Science & Technology Beijing *Beijing, China*

Research Experience

Graduate Research Associate *2016-Current*

Field of Microbiology, Cornell University *Ithaca, NY, US*

- Lead projects (i) *Listeria whole genome sequence reference sets for improved persistence assessment and source tracking*, (ii) *Microevolution of antimcrobial-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 *2014-2015*

Department of Environmental Sciences, Peking University *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 *2011-2014*

Department of Environmental Sciences, Peking University *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 doi:10.1111/1462-2920.15014
[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 Toxico 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 *Feb., 2020*
Oral Presenter *Ithaca, NY, US*
- Biogeography of edaphic *Listeria* across the United States

Microbiome, Cold Spring Harbor Laboratory Meeting *Jul., 2019*
Poster Presenter *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 *Mar., 2019*
Oral Presenter *Ithaca, NY, US*
- Nationwide distribution of *Listeria* in soil from natural environment

Biology of Genomes, Cold Spring Harbor Laboratory Meeting *May, 2018*
Poster Presenter *Cold Spring Harbor, NY, US*
- Serotype-specific evolutionary pattern of antimicrobial-resistant *Salmonella enterica*.

Microbiology Graduate Seminar, Cornell University *Apr., 2018*
Oral Presenter *Ithaca, NY, US*
- Serotype-specific evolutionary pattern of antimicrobial-resistant *Salmonella enterica*

Cornell University - Nestle Whole Genome Sequencing Training, Cornell University *Oct., 2017*
Oral Presenter *Ithaca, NY, US*
- Phylogenetic tree reconstruction.

Ecological & Evolutionary Genomics, Gordon Research Conference *Jul., 2017*
Poster Presenter *Biddeford, ME, US*
- Genetic stability and evolution of the *sigB* allele used for *Listeria* subtyping and phylogenetic inference

Microbiology Graduate Seminar, Cornell University *Mar., 2017*
Oral Presenter *Ithaca, NY, US*
- Genetic stability and evolution of *sigB* allele of *Listeria sensu stricto*

M.S. Dissertation Seminar, Peking University *Jun., 2014*
Oral Presenter *Beijing, China*
- The physicochemical property and microbial structure of oil contaminated soils

The 6th SNU-PKU-KU Environmental Workshop, Seoul National University *Jul., 2012*
Oral Presenter *Seoul, South Korea*
- Conservation of Chinese ecosystems: strategy and challenge

The 6th TU-USTB Joint Meeting on Sciences & Engineering Design, Tohoku University *Jul., 2010*
Oral Presenter *Sendai, Japan*
- The influence of climate change on human ecology

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*