

# Bo Li

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- **CONTACT ADDRESS**

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616 NE Northlake Place, Seattle, WA 98105

- **EDUCATION**

**Ph.D.** Civil Engineering, University of Hawaii at Manoa (Honolulu, HI.), 08/2016-05/2020

**M.S.** Environmental Engineering, Tsinghua University (Beijing, China), 09/2011-07/2014.

**B.S.** Environmental Engineering, Huazhong University of Science and Technology (Wuhan, China), 08/2007-06/2011

- **WORK EXPERIENCE**

07/2021-current Postdoctoral researcher, Civil & Environmental Engineering Department, University of Washington, Seattle, WA.

08/2020-06/2021 Postdoctoral researcher, Department of Civil and Environmental Engineering, University of Hawaii at Manoa, Honolulu, HI.

08/2016-05/2020 Research Assistant, Department of Civil and Environmental Engineering, University of Hawaii at Manoa, Honolulu, HI.

06/2015-06/2016 Research Assistant, Tsinghua University, Graduate School at Shenzhen, Shenzhen, China

- **HONORS AND AWARDS**

2019 GSO Grants and Awards, University of Hawaii at Manoa

2018, 2019 Graduate E.E. Black Scholarship, University of Hawaii at Manoa

2017 National Outstanding Achievement of Master's Engineering Practice, China

2014 Outstanding Master Thesis, Tsinghua University, China

2013 Jingzhi Academic Scholarship, Tsinghua University, China

- **AREAS OF SPECIALTY AND RESEARCH INTEREST**

**Human pathogens in the environments:** monitoring human pathogens and bacterial antibiotic resistance in complex environmental samples

**Environmental genomics and bioinformatics:** next generation sequencing and bioinformatics analysis for studying environmental microbiology

**Pollution control technologies:** biological process of pollutants from wastewater using activated sludge bioreactors

- **PROMINENT RESEARCH SKILLS**

**Molecular biology:** Primer design; probe design; PCR; Real-time PCR; multiplex PCR; 1-step and 2-step RT-qPCR; agarose gel electrophoresis; DNA/RNA extraction and purification

**Microbiology:** sterile technique; pipetting; culturing bacteria; streak-plating and spread-plating; antibiotic resistance test; electroporation; certificates of Bloodborne Pathogens and Safe Sharps Use and Transportation of Biological Substances Awareness (in University of Hawaii at Manoa)

**Bioreactor design, operation and modeling:** Anaerobic/Anoxic/Oxic (A<sup>2</sup>O) reactor; sequencing batch reactor (SBR); ANNAMOX reactor; Biofilm Reactors; Activated Sludge Model (ASM); Activated Sludge SIMulation Program (ASIM); Anaerobic Digestion Model No.1 (ADM1)

**Bioinformatics:** comprehensive analysis of amplicon, genome and metagenomic sequencing data, including quality control (FastQC, Trimmomatic, Fastx-toolkit); merging pair-ends (PEAR); contigs/genome assembly (Megahit, Metabat, CONCOCT); alignment and mapping (BLAST, Bowtie, BWA-MEM, SAMTOOL); gene analysis and genome annotation (GeneMark, Plasmidfinder, Integronfinder, PlasFlow, CARD-RGI, RAST); taxonomic analysis (QIIME2, MEGA, MEGAN, METAXA2, Kaiju, MetaPhlAn, StrainPhlan)

**Analytical chemistry:** gas chromatography (GC); high performance liquid chromatography (HPLC); ion chromatography (IC); UV spectrophotometer; Quibit

**Data analysis:** Jupyter Notebook; R studio; SPSS; Origin; Canoco; SigmaPlot; Microsoft software (Office, Excel, PowerPoint and Visio)

- **OTHER SKILLS**

Language: Mandarin (native user); English (proficient speaking and writing)

Computer: Linux bash language; Python language; Qualification Certificate of Computer and Software Technology Proficiency (in China); Computer grade three examination (in China)

Driver's license

- **PEER-REVIEWED JOURNAL ARTICLES** (\*indicates corresponding author)

- **Under review:**

1. **Bo Li**, Xu Li, Bing Wang, and Tao Yan\*. Population Metagenomic Approach Revealed Clustered Antibiotic Resistance Genes and High Mobility Potentials in Cattle Manure *Escherichia coli*.
2. Doris Yoong Wen Di, **Bo Li**, Min Ki Jeon, and Tao Yan\*. Department Comparing Solid-Based Concentration Methods for Rapid and Efficient Recovery of SARS-CoV-2 for Wastewater Surveillance.

- **Published:**

1. **Bo Li**, Xu Li and Tao Yan\* (2021). Quantitative Metagenomic Next-Generation Sequencing (qmNGS) for High-throughput Gene Quantification. *Applied and Environmental Microbiology*: AEM-00871. <https://doi.org/10.1128/AEM.00871-21>
2. **Bo Li**, Doris Yoong Wen Di, Prakrit Saingam, Min Ki Jeon, and Tao Yan\* (2021). Fine-Scale Temporal Dynamics of SARS-CoV-2 RNA Abundance in Wastewater during A COVID-19 Lockdown. *Water Research*, 197, 117093. <https://doi.org/10.1016/j.watres.2021.117093>
3. **Bo Li** and Tao Yan\* (2021). Next Generation Sequencing Reveals Limitation of qPCR Methods in Quantifying Emerging Antibiotic Resistance Genes (ARGs) in Environment. *Applied Microbiology and Biotechnology*, 105: 2925–2936. <https://doi.org/10.1007/s00253-021-11202-4>
4. Prakrit Saingam, **Bo Li**, Shihwu Sung and Tao Yan\* (2021). Immediate Impact of Hurricane Lane on Microbiological Quality of Coastal Water in Hilo Bay, Hawaii. *Environmental Science & Technology*, 55(5): 2960–2967. <https://doi.org/10.1021/acs.est.0c07082>
5. **Bo Li**, Zeng Chen, Fan Zhang, Yongqin Liu, and Tao Yan\* (2020). Abundance, diversity and mobility potential of antibiotic resistance genes in pristine Tibetan Plateau soil as revealed by soil metagenomics. *FEMS Microbiology Ecology*, 96(10): fiae172. <https://doi.org/10.1093/femsec/fiae172>
6. Prakrit Saingam, **Bo Li**, and Tao Yan\* (2020). Fecal indicator bacteria, direct pathogen detection, and microbial community analysis provide different microbiological water quality assessment of a tropical urban marine estuary. *Water Research*, 185, 116280. DOI: 0.1016/j.watres.2020.116280
7. **Bo Li**, Prakrit Saingam, Satoshi Ishii and Tao Yan\* (2019). Multiplex PCR coupled with direct amplicon sequencing for simultaneous detection of numerous waterborne pathogens. *Applied Microbiology and Biotechnology*, 103(2), 953-961. DOI: 10.1007/s00253-018-9498-z.

8. Prakit Saingam, **Bo Li**, Tao Yan\* (2018). Use of amplicon sequencing to improve sensitivity in PCR-based detection of microbial pathogen in environmental samples. *Journal of Microbiological Methods*, 149, 73-79. DOI: 10.1016/j.mimet.2018.05.005
9. Qidong Yin, Jia Miao, **Bo Li** and Guangxue Wu\* (2017). Enhancing electron transfer by ferrous iron during the anaerobic treatment of synthetic wastewater with mixed organic carbon. *International Biodeterioration & Biodegradation*, 119, 104-110. DOI: 10.1016/j.ibiod.2016.09.023
10. Qidong Yin, Zhenhu Hu, Yuepeng Sun, **Bo Li**, Guangxue Wu\* (2017). Effect of the dosage of ferrous iron on batch anaerobic treatment of high strength synthetic wastewater. *Desalination and Water Treatment*, 91: 152-158. DOI: 10.5004/dwt.2017.20737
11. **Bo Li**, Dan Wang, Mingyuan Li, Jie Wei and Guangxue Wu\* (2016). Technical Performance and Environmental Effects of the Treated Effluent of Wastewater Treatment Plants in the Shenzhen Bay Catchment, China. *Sustainability*, 8(10), 984. DOI: 10.3390/su8100984
12. **Bo Li** and Guangxue Wu (2014). Effects of sludge retention times on nutrient removal and nitrous oxide emission in biological nutrient removal processes. *International journal of environmental research and public health*, 11(4), 3553-3569. DOI: 10.3390/ijerph110403553
13. Guangxue Wu, Xiao Feng Zhai, **Bo Li**, Chengai Jiang and Yuntao Guan (2014). Endogenous nitrous oxide emission for denitrifiers acclimated with different organic carbons. *Procedia Environmental Sciences*, 21, 26-32. DOI: 10.1016/j.proenv.2014.09.004

• **Manuscript:**

1. **Bo Li**, Xu Li and Tao Yan\* (2021). Effect of Salinity on the Removal of Antibiotic Resistance Genes (ARGs) in Manure during Stockpiling.
2. **Bo Li**, Prakit Saingam and Tao Yan\* (2021). Next Generation Sequencing (NGS) Reveals Primer Dimers (PDs) formation and Non-specific Amplification in Polymerase Chain Reaction (PCR).
3. **Bo Li**, Xu Li, Bing Wang and Tao Yan\* (2021). Effect of essential oil feed additive on the microbial community and resistome cattle feces.
4. Prakit Saingam, **Bo Li**, and Tao Yan\* (2021). Virulence, Antibiotic Resistance, and Genotypic Diversity of *Vibrio parahaemolyticus* isolates from a tropical urban estuary in Hawaii.

- **PROVISIONAL PATENT**

Tao Yan and **Bo Li** (2021). Quantitative Metagenomic Sequencing Approach for High Throughput Gene Quantification and Demonstration with Environmental Antibiotic Resistance Genes. Application number: 63/188,398

- **BOOK CHAPTER**

1. Guangxue\* Wu, **Bo Li**, Yan Yan (2018). N<sub>2</sub>O emission during biological nitrogen removal. DOI: 10.2166/9781780406312\_101.

- **CONFERENCE PRESENTATION/PAPERS**

1. **Bo Li**, and Tao Yan\*. Integration of Antimicrobial Resistant Bacterial Isolate Libraries and Metagenomics Sequencing for Quantitative Antimicrobial Resistance (AMR) Risk Assessment in Cattle Manure. The 258th American Chemical Society (ACS) National Meeting, Aug. 27-29, 2019, San Diego, CA. (Poster Presentation)

2. **Bo Li**, and Tao Yan\*. Drinking Water and Citizen Science: Between Perceived Concerns and Actual Microbiological Quality. The 258th ACS National Meeting, Aug. 27-29, 2019, San Diego, CA. (Poster Presentation)

3. **Bo Li**, and Tao Yan\*. Effect of Salinity on Antibiotic Resistant Genes (ARGs) in Cattle Manure during Stockpiling. Pacific Water Conference, Feb. 20-21, 2019. Honolulu, HI. (Poster Presentation)

4. **Bo Li**, and Tao Yan\*. Multiplex PCR coupled with Next Generation Sequencing for High Throughput Detection of Bacterial Pathogens. Pacific Water Conference, Feb. 7-8, 2018. Honolulu, HI. (Poster Presentation)

5. **Bo Li**, Guangxue Wu\*, Hongying Hu, Yihui Wu and Yumei Guo. Evaluation of Greenhouse Gas Emission from the 7th Wastewater Treatment Plant in Kunming, China Beijing International Environmental Technology Symposium, Oct. 20-23, 2013, Beijing, China (Oral Presentation, Conference Paper).

- **RESEARH PROJIECT EXPERIENCE**

University of Hawaii COVID Response. “Wastewater Monitoring of SARS-CoV-2 Viral RNA for UH Manoa Dormitories”, 11/15/2020-05/30/2021

USDA-NIFA. “Instant Biofumigation Using Natural Products From Papaya Seed Waste for Sustainable Management of Soil-borne Plant Pathogens”, 05/01/20-04/30/2023.

NSF (Environmental Engineering), “RAPID: Determine Community Disease Burden of COVID-19 by Probing Wastewater Microbiome”, 05/01/2020-04/30/2021.

City and County of Honolulu, “Wastewater Testing for SARS-CoV-2 RNA for the City and County of Honolulu”, Tao Yan (PI), 07/01/2020-12/31/2020

USDA NIFA, “Mitigating the Risk of Antibiotic Resistance at Critical Control Points in the Beef Cattle Manure Management Systems”, 07/01/2017-06/30/2021

NSF (Environmental Engineering), “Transform Municipal Wastewater Treatment Plants into Community Enteric Disease Information Networks”, 08/1/2015-01/31/2021

NSF, “RAPID: Molecular and Metagenomic Understanding of Coastal Water Quality and Health Risks after Hurricane Lane”, 11/01/18-4/30/2021

Hawaii Community Foundation, “Identify Novel ESBLs and Determine Their Horizontal Gene Transfer Potentials in Soil Resistome”, 06/01/2016-12/31/2017

- **REVIEWER FOR JOURNALS**

*Water Research; mSystems; Science of the Total Environment; Environmental Pollution; PLOS One; Journal of Environmental Sciences; AQUA - Water Infrastructure, Ecosystems and Society*

- **PROFESSIONAL ACTIVITIES**

American Society for Microbiology (ASM), member

Association of Environmental Engineering and Science Professors (AEESP), member

Chinese-American Professors in Environmental Engineering and Science (CAPEES), member