

**Ran Mei, Ph.D.**

National Institute of Advanced Industrial Science and Technology (AIST)

Central 6, Higashi 1-1-1 · Tsukuba · Ibaraki 305-8566 · Japan

+81 80 5970 7199 · r.mei@aist.go.jp

**EDUCATION**

2015-20 Ph.D. in Environmental Engineering, University of Illinois at Urbana-Champaign (UIUC) · USA

2013-15 M.S. in Environmental Engineering, University of Illinois at Urbana-Champaign (UIUC) · USA

2009-13 B.Eng. in Energy and Resources Engineering, Peking University · China

**PROFESSIONAL EXPERIENCE**

2021- Postdoctoral Fellow, AIST (PI: Dr. Masaru K. Nobu)

2013-20 Graduate Research Assistant, UIUC (PI: Prof. Wen-Tso Liu)

2011-13 Undergraduate Researcher, Peking University (PI: Prof. Xiaolei Wu; Prof. Xidong Wang)

**HONORS AND AWARDS**

2022 Postdoctoral Fellowship for Research in Japan, Japan Society for the Promotion of Science (JSPS)

2021 Jacobs Engineering Group/AEESP Outstanding Doctoral Dissertation Award, Association of Environmental Engineering and Science Professors (AEESP)

2020 Outstanding Self-financed Students Abroad, China Scholarship Council

2020 Engelbrecht Fellowship, UIUC

2019 Warren W. Yee Memorial Fellowship, UIUC

2013 Environmental Engineering and Science Fellowship, UIUC

2012 Yihai Kerry Scholarship, Peking University

2011 Kwang-Hua Scholarship, Peking University

2011 PKU COE UPOS Fellowship, Peking University

**RESEARCH TOPICS**

Environmental Engineering: biological wastes and wastewater treatment; anaerobic digestion; activated sludge

Microbial Ecology: community ecology; meta-omics; anaerobic metabolism

Evolution and Comparative Genomics: methanogenesis; Archaea; gene clustering

**FUNDED RESEARCH**

2022-24 Grant-in-Aid for JSPS Fellows, JSPS

Global gene cataloguing-based reconstruction of the evolutionary transition from simple to complex cells (JSPS-22F22379; direct Cost: ¥2,200,000)

Role: PI (Co-PI: Masaru K. Nobu)

**PUBLICATIONS***Peer-reviewed, first/co-first authorship*

1. **Mei, R.**, Kaneko, M., Imachi, H., and Nobu, M.K.\*, 2023. The origin and evolution of methanogenesis and Archaea are intertwined. *PNAS Nexus*, accepted.

2. **Mei, R.** and Liu, W.T.\*, 2022. Meta-omics supervised characterization of respiration activities associated with microbial immigration in anaerobic digestion. *Environmental Science & Technology*, 56, 10, 6689-6698.
3. **Mei, R.**, Nobu, M.K. and Liu, W.T.\*, 2020. Identifying anaerobic amino acids degraders through the comparison of short-term and long-term enrichments. *Environmental Microbiology Reports*, 12(2), 173-184.
4. **Mei, R.**, Nobu, M.K., Narihiro, T. and Liu, W.T.\*, 2020. Metagenomic and metatranscriptomic analyses revealed uncultured *Bacteroidales* populations as the dominant proteolytic amino acid degraders in anaerobic digesters. *Frontiers in Microbiology*, 11, 2763.
5. Lam, Y.C., **Mei, R.** (co-first author), Wu, Z., Lee, P.K., Liu, W.T.\* and Lee, P.H.\*, 2020. Superior resolution characterization of microbial diversity in anaerobic digesters using full-length 16S rRNA gene amplicon sequencing. *Water Research*, 178, 115175.
6. Kim, J., **Mei, R.** (co-first author), Wilson, F.P., Yuan, H., Bocher, B.T.W. and Liu, W.T.\*, 2020. Ecogenomics-based mass balance model reveals the effects of fermentation conditions on microbial activity. *Frontiers in Microbiology*, 11, 3115.
7. **Mei, R.** and Liu, W.T.\*, 2019. Quantifying the contribution of microbial immigration in engineered water systems. *Microbiome*, 7, 144.
8. **Mei, R.**, Kim, J., Wilson, F.P., Bocher, B.T.W. and Liu, W.T.\*, 2019. Coupling growth kinetics model and machine learning quantifies microbial immigration impacts and identifies key environmental parameters in a biological wastewater treatment process. *Microbiome*, 7, 65.
9. **Mei, R.**, Nobu, M.K., Narihiro, T., Yu, J., Sathyagal, A., Willman, E. and Liu, W.T.\*, 2018. Novel *Geobacter* species and diverse methanogens contribute to enhanced methane production in media-added methanogenic reactors. *Water Research*, 147, 403-412.
10. **Mei, R.**, Nobu, M.K., Narihiro, T., Kuroda, K., Sierra, J., Wu, Z.Y., Ye, L., Lee, P.K.H., Lee, P.H., van Lier, J.B., McInerney, M.J., Kamagata, Y. and Liu, W.T.\*, 2017. Operation-driven heterogeneity and overlooked feed-associated populations in anaerobic digester microbiome. *Water Research*, 124, 77-84.
11. **Mei, R.**, Narihiro, T., Nobu, M.K., Kuroda, K. and Liu, W.T.\*, 2016. Evaluating digestion efficiency in full-scale anaerobic digesters by identifying active microbial populations through the lens of microbial activity. *Scientific Reports*, 6:34090.
12. **Mei, R.**, Narihiro, T., Nobu, M.K. and Liu, W.T.\*, 2016. Effects of heat shocks on microbial community structure and microbial activity of a methanogenic enrichment degrading benzoate. *Letters in Applied Microbiology*, 63(5), 356-362.

*Peer-reviewed, contributing authorship*

1. Nobu, M.K., Narihiro, T., **Mei, R.**, Kamagata, Y., Lee, P.H., Lee, P.K., McInerney, M.J. and Liu, W.T.\*, 2020. Catabolism and interactions of uncultured organisms shaped by eco-thermodynamics in methanogenic bioprocesses. *Microbiome*, 8, 111.
2. Ye, L.\*, **Mei, R.**, Liu, W.T., Ren H. and Zhang, X.\*, 2020. Machine learning-aided analyses of thousands of draft genomes reveal specific features of activated sludge processes. *Microbiome*, 8, 16.
3. Sun, H., **Mei, R.**, Zhang, X., Ren H., Liu, W.T. and Ye, L.\*, 2020. Bacterial enrichment in highly-selective acetate-fed bioreactors and its application in rapid biofilm formation. *Water Research*, 170.
4. Yuan, H., **Mei, R.**, Liao, J. and Liu, W.T.\*, 2019. Nexus of stochastic and deterministic processes

on microbial community assembly in biological systems. *Frontiers in Microbiology*, 10, 1536.

5. Zealand, A. M., **Mei, R.**, Papachristodoulou, P., Roskilly, A. P., Liu, W. T. and Graham, D. W.\*, 2019. Molecular microbial ecology of stable versus failing rice straw anaerobic digesters. *Microbial Biotechnology*, 12(5), 879-891.
6. Narihiro, T., Nobu, M.K., Bocher, B.T.W., **Mei, R.** and Liu, W.T.\*, 2018. Co-occurrence network analysis reveals thermodynamics-driven microbial interactions in methanogenic bioreactors. *Environmental Microbiology Reports*, 10(6), 673-685.
7. Zealand, A. M., **Mei, R.**, Papachristodoulou, P., Roskilly, A. P., Liu, W. T. and Graham, D. W.\*, 2018. Microbial community composition and diversity in rice straw digestion bioreactors with and without dairy manure. *Applied Microbiology and Biotechnology*, 102(19), 8599-8612.
8. Nobu, M.K., Narihiro, T., Liu, M.M., Kuroda, K., **Mei, R.** and Liu, W.T.\*, 2017. Thermodynamically diverse syntrophic aromatic compound catabolism. *Environmental Microbiology*, 19(11), 4576-4586.
9. Kuroda, K., Nobu, M.K., **Mei, R.**, Narihiro, T., Bocher, B.T., Yamaguchi, T. and Liu, W.T.\*, 2016. A Single-Granule-Level Approach Reveals Ecological Heterogeneity in an Upflow Anaerobic Sludge Blanket Reactor. *PloS One*, 11(12), p.e0167788.
10. Nobu, M.K., Narihiro, T., Kuroda, K., **Mei, R.** and Liu, W.T.\*, 2016. Chasing the elusive Euryarchaeota class WSA2: genomes reveal a uniquely fastidious methyl-reducing methanogen. *The ISME Journal*, 10(10), 2478-2487.
11. Pan, X.C., Geng, S., Lv, X.L., **Mei, R.**, Jiangyang, J.H., Wang, Y.N., Xu, L., Liu, X.Y., Tang, Y.Q., Wang, G.J. and Wu, X.L.\*, 2015. *Defluviimonas alba* sp. nov., isolated from an oilfield. *International Journal of Systematic and Evolutionary Microbiology*, 65(6), 1805-1811.
12. Narihiro, T., Kim, N.K., **Mei, R.**, Nobu, M.K. and Liu, W.T.\*, 2015. Microbial community analysis of anaerobic reactors treating soft drink wastewater. *PloS One*, 10(3), p.e0119131.
13. Geng, S., Pan, X.C., **Mei, R.**, Wang, Y.N., Liu, X.Y., Wang, X.B., Tang, Y.Q. and Wu, X.L.\*, 2015. *Glycocaulis alkaliophilus* sp. nov., a dimorphic prosthecate bacterium isolated from crude oil. *International Journal of Systematic and Evolutionary Microbiology*, 65(3), 838-844.
14. Geng, S., Pan, X.C., **Mei, R.**, Wang, Y.N., Sun, J.Q., Liu, X.Y., Tang, Y.Q. and Wu, X.L.\*, 2015. *Paradevosia shaoguanensis* gen. nov., sp. nov., Isolated from a Coking Wastewater. *Current Microbiology*, 70(1), 110-118.
15. Pan, X.C., Geng, S., **Mei, R.**, Wang, Y.N., Cai, H., Liu, X.Y., Tang, Y.Q., Nie, Y., Ye, S.Y. and Wu, X.L.\*, 2014. *Nitratireductor shengliensis* sp. nov., isolated from an oil-polluted saline soil. *Current Microbiology*, 69(4), 561-566.
16. Geng, S., Pan, X.C., **Mei, R.**, Wang, Y.N., Sun, J.Q., Liu, X.Y., Tang, Y.Q. and Wu, X.L.\*, 2014. *Ottomia shaoguanensis* sp. nov., isolated from coking wastewater. *Current Microbiology*, 68(3), 324-329.

#### Book chapter

1. Narihiro, T., Nobu, M.K., **Mei, R.** and Liu, W.T., 2015. Microbial Community Involved in Anaerobic Purified Terephthalic Acid Treatment Process. *Anaerobic Biotechnology: Environmental Protection and Resource Recovery*. Imperial College Press, London, pp.31-48.

**SERVICE**

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*Reviewer for Journals*

Bioresource Technology (5), Environment International (5), Journal of Hazardous Materials (5), Environmental Science & Technology (3), Water Research (3), Environmental Microbiology Reports (1), Frontiers in Microbiology (1), Chemical Engineering Journal (1), PLOS ONE (1), Science of the Total Environment (1), Engineering (1), Bioengineering (1), iMeta (1), Biotechnology Reports (1), BMC Microbiology (1).

**PRESENTATIONS**

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- 2019 “Coupling growth kinetics modeling with machine learning reveals Microbial immigration impacts and identifies key environmental parameters in a biological wastewater treatment process”. 8th IWA MEWE Specialist Conference, Hiroshima, Japan (oral)
- 2019 “Identifying anaerobic amino acids degraders through the comparison of short-term and long-term enrichments”. 8th IWA MEWE Specialist Conference, Hiroshima, Japan (poster)
- 2018 “Metabolic partitioning among microbial dark matter across anaerobic digesters”. The 13<sup>th</sup> JGI Annual Meeting, Walnut Creek, California (poster)
- 2017 “Distribution of populations associated with known syntrophs and methanogens in the global anaerobic digester microbiome”. Anaerobic Microbial Syntrophy Forum, Chengdu, China (oral)
- 2017 “Operation-driven heterogeneity and overlooked feed-associated populations in anaerobic digester microbiome” The 15<sup>th</sup> IWA International Conference on AD, Beijing, China (poster)
- 2017 “Operation-driven heterogeneity and overlooked feed-associated populations in anaerobic digester microbiome”. The 12<sup>th</sup> JGI Annual Meeting, Walnut Creek, California (poster)
- 2016 “Microbiome of anaerobic digesters at 51 municipal wastewater reclamation plants”. ISME16, Montreal, Canada (poster)
- 2016 “Microbiome of anaerobic digesters at 51 municipal wastewater treatment plants”. The 11<sup>th</sup> JGI Annual Meeting, Walnut Creek, California (poster)
- 2015 “Microbial community response of a mesophilic methanogenic enrichment to temperature perturbations”. ASM2015, New Orleans, Louisiana (poster)

**TEACHING AND MENTORING**

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*Teaching*

- 2019 Guest lecture, CEE 444 [Biological Principles in Environmental Engineering], UIUC
- 2018 Course development and instruction (new course), CEE 540 [Remediation Design], UIUC
- 2017 Guest lecture, CEE 538 [Water Quality Control Process II], UIUC
- 2016 Guest lecture, CEE 437 [Water Quality Engineering], UIUC

*Mentoring*

- 2016 *Qinye (Jenny) Si*, MS student independent research, UIUC
- 2016 *Theodore Chan*, research experience for undergraduate program, UIUC
- 2015 *Lama Aoudi*, research experience for undergraduate program, UIUC
- 2014 *Lucas Rocha Melogno*, undergraduate student independent research, UIUC