

Mohan Qin

Assistant Professor

Department of Civil and Environmental Engineering

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EDUCATION

- 2017 Ph.D., Civil Engineering, Virginia Tech
2013 M.S., Environmental Engineering, Peking University
2010 B.S., Environmental Engineering, Shandong University

PROFESSIONAL EXPERIENCE

- 2020-present Assistant Professor, Department of Civil and Environmental Engineering, University of Wisconsin–Madison
2018-2019 Research Associate, Department of Chemical and Environmental Engineering, Yale University
2016-2017 Graduate Teaching Assistant, Department of Civil and Environmental Engineering, Virginia Tech
2014-2017 Graduate Research Assistant, Department of Civil and Environmental Engineering, Virginia Tech

JOURNAL PUBLICATIONS

Publications after joining UW-Madison (*Denotes corresponding author)

30. Yang, K. and **Qin, M.*** Enhancing Selective Ammonium Transport in Membrane Electrochemical Systems. *Water Research*.
29. Yang, K. and **Qin, M.*** Understanding Ammonia and Water Transport in Direct Contact Membrane Distillation towards Selective Ammonia Recovery. *ACS ES&T Engineering*.
28. Burns, M., Tang, H., Larson, R. A., & **Qin, M.*** Bioelectrochemically-Assisted Ammonia Recovery from Dairy Manure. *Water Research*, 2024, 121243.
27. Wang, R., Yang, K., Wong, C., Aguirre-Villegas, H., Larson, R., Brushett, F., **Qin, M.**,* and Jin, S.* Electrochemical ammonia recovery and co-production of chemicals from manure wastewater. *Nature Sustainability*, 2023, 1-12.
26. Wu, Z., **Qin, M.**,* and Wei, H.* Improved Reliability of Raman Spectroscopic Imaging of Low-Micrometer Microplastic Mixtures in Lake Water by Fractionated Membrane Filtration. *ACS ES&T Water*, 2023, 3, 2616-2626.
25. Yang, K., Du, H., and **Qin, M.*** Solar Enhanced Membrane Distillation for Ammonia Recovery. *Journal of Membrane Science Letters*, 2023, 3.1, 100043.
24. Burns, M. and **Qin, M.*** Ammonia Recovery from Organic Nitrogen in Synthetic Dairy Manure with a Microbial Fuel Cell. *Chemosphere*, 2023, 325, 138388.
23. Wu, Z., Cai, S., Cho, S.W., Wei, H.,* and **Qin, M.*** Laboratory Filter Membranes May Release

- Organic Particles that Affect Water Analysis. *ACS ES&T Engineering*, 2022, 2.12, 2311-2316.
22. Yang, K. and **Qin, M.*** "The Application of Cation Exchange Membranes in Electrochemical Systems for Ammonia Recovery from Wastewater." *Membranes*, 2021, 11.7, 494.
 21. Sun, M., **Qin, M.**, Wang, C., Weng, G., Huo, M., Taylor, A., Qu, J., Elimelech, M.* "Electrochemical-Osmotic Process for Simultaneous Recovery of Electric Energy, Water, and Metals from Wastewater" *Environmental Science & Technology*, 2020, 54, 8430-8442.
 20. Patel, S. K., Ritt, C., Deshmukh, A., Wang, Z., **Qin, M.**, Epsztein, R., Elimelech, M.* "The Relative Insignificance of Advanced Materials in Enhancing the Energy Efficiency of Desalination Technologies." *Energy & Environmental Science*, 2020, 13, 1694-1710.
 19. Patel, S. K., **Qin, M.**, Walker, W. S., Elimelech, M.* "Energy Efficiency of Electro-Driven Brackish Water Desalination: Electrodialysis Significantly Outperforms Membrane Capacitive Deionization." *Environmental Science & Technology*, 2020, 54 (6), 3663-3677.

Publications prior to joining UW-Madison

18. **Qin, M.**, Deshmukh, A., Epsztein, R., Patel, S.K., Owoseni, O. M., Walker, W. S., Elimelech, M.* "Comparison of Energy Consumption in Desalination by Capacitive Deionization and Reverse Osmosis." *Desalination*, 2019, 455: 100-114.
17. Epsztein, R., Shaulsky, E., **Qin, M.**, Elimelech, M.* "Activation Behavior for Ion Permeation in Ion-Exchange Membranes: Role of Ion Dehydration in Selective Transport." *Journal of Membrane Science*, 2019, 580: 316-326.
16. Zou, S., **Qin, M.**, He, Z.* "Tackle Reverse Solute Flux in Forward Osmosis towards Sustainable Water Recovery: Reduction and Perspectives." *Water Research*, 2018, 149: 362-374.
15. **Qin, M.**, White, C., Zou, S., He, Z.* "Passive Separation of Recovered Ammonia from Catholyte for Reduced Energy Consumption in Microbial Electrolysis Cells." *Chemical Engineering Journal*, 2018, 334: 2303-2307.6
14. **Qin, M.** and He, Z.* "Resource Recovery by Osmotic Bioelectrochemical Systems towards Sustainable Wastewater Treatment." *Environmental Science: Water Research & Technology*, 2017, 3: 583-592. (Front Cover).
13. Yang, Y., **Qin, M.**, Yang, X., He, Z.* "Sustainable Operation of Osmotic Microbial Fuel Cells through Effective Reproduction of Polyelectrolyte Draw Solutes Facilitated by Cathodic pH Increase." *Journal of Cleaner Production*, 2017, 168.1: 1143-1149.
12. **Qin, M.**, Liu, Y., Luo, S., Qiao, R., He, Z.* "Integrated Experimental and Modeling Evaluation of Energy Consumption for Ammonia Recovery in Bioelectrochemical Systems." *Chemical Engineering Journal*, 2017, 327: 924-931.
11. **Qin, M.**, Hynes, E.A., Abu-Reesh, I.M., He, Z.* "Ammonium Removal from Synthetic Wastewater Promoted by Current Generation and Water Flux in an Osmotic Microbial Fuel Cell." *Journal of Cleaner Production*, 2017, 149: 856-862.
10. Zou, S., **Qin, M.**, Moreau, Y., He, Z.* "Nutrient-Energy-Water Recovery from Synthetic Sidestream Centrate Using a Microbial Electrolysis Cell-Forward Osmosis Hybrid System." *Journal of Cleaner Production*, 2017, 154: 16-25.

9. Yang, Y., **Qin, M.**, Yang, X., He, Z.* “Enhancing Hydrogen Production in Microbial Electrolysis Cells by *in situ* Hydrogen Oxidation for Self-Buffering pH through Periodic Polarity Reversal.” *Journal of Power Sources*, 2017, 347: 21-28.
8. **Qin, M.**, Abu-Reesh, I.M., He, Z.* “Effects of Current Generation and Electrolyte pH on Reverse Salt Flux across Thin Film Composite Membrane in Osmotic Microbial Fuel Cells.” *Water Research*, 2016, 105: 583-590.
7. **Qin, M.**, Maza, W.A., Stratakes, B.M., Ahrenholtz, S.R., Morris, A.J.,* He, Z.* “Nanoparticulate Ni(OH)₂ Films Synthesized from Macrocyclic Nickel (II) Cyclam for Hydrogen Production in Microbial Electrolysis Cells.” *Journal of the Electrochemical Society*, 2016, 163: F437-F442.
6. Liu, Y., **Qin, M.**, Luo, S., He, Z.,* Qiao, R.* “Understanding Ammonium Transport in Bioelectrochemical Systems towards its Recovery.” *Scientific Reports*, 2016, 6.
5. **Qin, M.**, Molitor, H., Brazil, B., Novak, J.T., He, Z.* “Recovery of Nitrogen and Water from Landfill Leachate by a Microbial Electrolysis Cell–Forward Osmosis System.” *Bioresource Technology*, 2016, 200: 485-492.
4. **Qin, M.**, Ping, Q., Lu, Y., Abu-Reesh, I.M., He, Z.* “Understanding Electricity Generation in Osmotic Microbial Fuel Cells through Integrated Experimental Investigation and Mathematical Modeling.” *Bioresource Technology*, 2015, 195: 194-201.
3. Lu, Y., **Qin, M.**, Yuan, H., Abu-Reesh, I.M., He, Z.* “When Bioelectrochemical Systems Meet Forward Osmosis: Accomplishing Wastewater Treatment and Reuse Through Synergy.” *Water*, 2014, 7.1: 38-50.
2. **Qin, M.** and He, Z.* “Self-supplied Ammonium Bicarbonate Draw Solute for Achieving Wastewater Treatment and Recovery in a Microbial Electrolysis Cell-Forward Osmosis-Coupled System.” *Environmental Science & Technology Letters*, 2014, 1.10: 437-441.
1. **Qin, M.**, Zhao, H.,* Ren, L., Wang, Z. “Study on the Coagulation Efficiency of Covalent Bonded Aluminum-Silicon Hybrid Flocculants.” *Chinese Journal of Environmental Engineering*, 2014, 8.4: 1262-1266.

CONFERENCE TALKS (* Presenter)

34. **Qin, M.*** (Invited talk) Ammonia recovery from livestock manure using membrane electrochemical systems. The ACS Fall 2023 National Meeting & Exposition. August 13 – 17, 2023, San Francisco, CA. (Oral)
33. Yang, K.,* Du, H., and **Qin, M.** Enhanced ammonia recovery from wastewater by photothermal-incorporated membrane distillation. The ACS Fall 2023 National Meeting & Exposition. August 13 – 17, 2023, San Francisco, CA. (Oral)
32. Wang, R., Yang, K., **Qin, M.**, and Jin, S.* Ammonia Recovery from Manure Wastewater and Simultaneous Electrosynthesis Using Ammonium-Ion Selective Redox Material. The ACS Fall 2023 National Meeting & Exposition. August 13 – 17, 2023, San Francisco, CA. (Oral)
31. Burns, M.* and **Qin, M.** Mitigating water quality impacts of manure with bioelectrochemical systems for resource recovery. The ACS Fall 2023 National Meeting & Exposition. August 13 – 17, 2023, San Francisco, CA. (Oral)

30. Yang, K. and **Qin, M.*** (Invited talk) Enhanced Ammonia Recovery from Wastewater Using Solar Photothermal Membrane Distillation. 10th International Water Association Membrane Technology Conference, July 23-26, 2023, St. Louis, MO. (Oral)
29. Yang, K.,* Du, H., and **Qin, M.** Photothermal Membrane Distillation for Enhanced Ammonia Recovery from Wastewater. 2023 AEESP Research & Education Conference, June 20-23, 2023, Boston, MA. (Poster)
28. Wu, Z.,* **Qin, M.**, and Wei, H. Raman Spectroscopy Coupled with Fractionated Membrane Filtration Improves the Quantification Reliability of Low Micrometer Microplastics. 2023 AEESP Research & Education Conference, June 20-23, 2023, Boston, MA. (Oral)
27. Burns, M.* and **Qin, M.** Ammonia Recovery from Dairy Manure in Bioelectrochemical Systems towards Sustainable Manure Processing. 2023 AEESP Research & Education Conference, June 20-23, 2023, Boston, MA. (Poster)
26. Wang, R.,* Yang, K., **Qin, M.**, and Jin, S. Ammonium Recovery from Manure Wastewater and Simultaneous Electrosynthesis Using Ammonium-Ion Selective Redox Material. The 243rd ECS Meeting and 18th International Symposium on Solid Oxide Fuel Cells. May 28-June 2, 2023, Boston, MA. (Oral)
25. **Qin, M.*** and Gregory W. Harrington. Environmental Engineering Materials: A New Required Course for an Undergraduate Environmental Engineering Program. 2023 AEESP Research & Education Conference, June 20-23, 2023, Boston, MA. (Oral)
24. Wang, R.,* Yang, K., **Qin, M.**, and Jin, S. Ammonium Recovery from Manure Wastewater and Simultaneous Electrosynthesis Using Ammonium-Ion Selective Redox Material. The 243rd ECS Meeting and 18th International Symposium on Solid Oxide Fuel Cells. May 28-June 2, 2023, Boston, MA. (Oral)
23. Wu, Z.,* **Qin, M.**, and Wei, H. Reliable Detection and Characterization of Small Microplastics in Lake Water Using Raman Spectroscopy Coupled with Fractionated Membrane Filtration. UW-Madison Day at the Capitol, April 26, 2023, Madison, WI. (Poster)
22. Wu, Z.,* Cho, S.W., Cai, S., Wei, H., and **Qin, M.** "Organic particles released from commercial membranes: Origins, implications, and mitigation strategies." The ACS Fall 2022 National Meeting & Exposition. August 21 – 25, 2022, Chicago, IL. (Oral)
21. Yang, K.,* and **Qin, M.** "Simulation of Selective Nitrogen Recovery in Membrane Electrochemical System." AEESP conference, June 28-30, 2022, St. Louis, MO. (Poster)
20. Burns, M.,* and **Qin, M.** "Ammonia recovery from organic nitrogen in synthetic dairy manure via microbial fuel cells." AEESP conference, June 28-30, 2022, St. Louis, MO. (Poster)
19. Burns, M.,* and **Qin, M.** "Integrating microbiology and electrochemistry for sustainable fertilizer production: a resource recovery approach to microbial fuel cells." Midwest Women In Science Conference 2021 September 18 – 19, 2021, online. (Oral)
18. Yang, K.,* and **Qin, M.** "Simulation of Selective Nitrogen Recovery in Membrane Electrochemical System." Computing in Engineering Forum 2021, September 21-23, 2021, Madison, WI. (Poster)

17. **Qin, M.**,* Patel, S. K., Walker, W. S., Elimelech, M. "Energy Efficiency of Electro-Driven Brackish Water Desalination: Electrodialysis Significantly Outperforms Membrane Capacitive Deionization." NAMS 2020 Online Conference, May 18-21, 2020. (Oral)
16. **Qin, M.**,* Deshmukh, A., Epsztein, R., Patel, S.K., Owoseni, O. M., Walker, W. S., Elimelech, M. "Comparison of Energy Consumption in Desalination by Capacitive Deionization and Reverse Osmosis." The 2019 AEESP Conference. May 14-16, 2019, Tempe, AZ. (Poster)
15. **Qin, M.** and He, Z.* "Osmotic Bioelectrochemical Systems: a New Approach for Nutrient-Energy-Water (NEW) Recovery from Wastewater." The 15th IWA World Conference on Anaerobic Digestion. October 17-20, 2017, Beijing, China. (Oral)
14. **Qin, M.*** and He, Z. "Coupled Microbial Electrolysis Cell-Forward Osmosis System for Sustainable Wastewater Treatment and Resource Recovery." The 254th ACS National Meeting. August 20-24, 2017, Washington D.C. (Poster)
13. **Qin, M.** and He, Z.* "Nutrient-Energy-Water (NEW) Recovery by Osmotic Bioelectrochemical Systems towards Sustainable Wastewater Treatment." The 254th ACS National Meeting. August 20-24, 2017, Washington D.C. (Oral)
12. **Qin, M.**,* Abu-Reesh, I.M., He, Z. "Controlling the Reverse Salt Flux in Osmotic Microbial Fuel Cells." The 2017 AEESP Conference. June 20-22, 2017, Ann Arbor, MI. (Poster)
11. **Qin, M.**,* Abu-Reesh, I.M., He, Z. "Effects of Bioelectricity Generation and Electrolyte pH on Reverse Salt Flux across Thin Film Composite Membrane in Osmotic Microbial Fuel Cells." 3rd Meeting of the North American branch of the ISMET. October 5-7, 2016, Stanford, CA. (Oral)
10. **Qin, M.*** and He, Z. "Osmotic Microbial Fuel Cells: A New Approach for Wastewater Treatment, Clean Water Extraction and Bioelectricity Generation." WaterJAM. September 12-15, 2016, Virginia Beach, VA. (Oral)
9. **Qin, M.*** and He, Z. "Sustainable Ammonium Recovery from Wastewater using Microbial Electrolysis Cells." WaterJAM. September 12-15, 2016, Virginia Beach, VA. (Poster)
8. **Qin, M.** and He, Z.* "Sustainable Ammonium Recovery from Wastewater by Using Bioelectrochemical Systems." Residuals and Biosolids. April 3-6, 2016, Milwaukee, WI. (Oral)
7. **Qin, M.*** and He, Z. "Osmotic Microbial Fuel Cells: A New Approach for Wastewater Treatment, Clean Water Extraction and Bioelectricity Generation." Virginia Tech 32nd GSA Research Symposium & Expo. March 23, 2016, Blacksburg, VA. (Oral)
6. **Qin, M.** and He, Z.* "Improving Wastewater Reuse Using Self-Supplied Ammonium Draw Solute in a Coupled Microbial Electrolysis Cell Forward Osmosis System." The 88th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC 2015). September 28-30, 2015, Chicago, IL. (Oral)
5. **Qin, M.*** and He, Z. "Self-supplied NH₃-CO₂ Draw Solute for Achieving Wastewater Treatment and Recovery in a Microbial Electrolysis Cell-Forward Osmosis-Coupled System." WaterJAM. September 14-17, 2015, Virginia Beach, VA. (Oral)
4. **Qin, M.**,* Maza, W.A., Stratakes, B.M., Ahrenholtz, S.R., Morris, A.J., He, Z. "Nanoparticulate Ni(OH)₂ Films Synthesized from Macrocyclic Nickel (II) Cyclam for Hydrogen Production in Microbial Electrolysis Cells." WaterJAM. September 14-17, 2015, Virginia Beach, VA. (Poster)

3. **Qin, M.*** and He, Z. "Self-supplied NH₃-CO₂ Draw Solute for Achieving Wastewater Treatment and Recovery in a Microbial Electrolysis Cell-Forward Osmosis-Coupled System." The 2015 AEESP Research and Education Conference. June 13-16, 2015, New Haven, CT. (Oral)
2. **Qin, M.** and He, Z.* "Recovering Ammonium Bicarbonate to Achieve Wastewater Treatment and Reuse in a Microbial Electrolysis Cell – Forward Osmosis Coupled System." Water and Energy 2015. June 8-10, 2015, Washington DC. (Oral)
1. **Qin, M.*** and He, Z. "Influence of Electricity Generation on Reverse Salt Flux in an Osmotic Microbial Fuel Cell." The 2nd NA-ISMET meeting. May 13-15, 2014. University Park, PA. (Poster)

CURRENT AND FORMER GROUP MEMBERS

Supervised Graduate Students

Name	Degree	Graduation Date	Current Position
Samarpan Deb Majumder	M.S.	2023.05	Ph.D. Student at George Washington University
Hanyu Tang	M.S.	2022.12	Ph.D. Student at UW-Madison

Current Graduate Students

Name	Degree	Expected Graduation Date
Kai Yang	Ph.D.	2024
McKenzie Burns	Ph.D.	2025
Ziyan Wu	Ph.D.	2026
Hanyu Tang	Ph.D.	2027
Zhijie Wang	Ph.D.	2028

Supervised Postdoctoral Associates and Visiting Scholars

Name	Dates	Current Position
Hongang Du	2022.05-2022.08	Ph.D. Student at Johns Hopkins University
Masoumeh Moradiahghi	2022.06-2023.06	Assistant Research Scientist, University of Maryland-College Park

TEACHING

Instructor, CEE 320: Introduction to Environmental Engineering

Semesters: Fall 2020, Fall 2022.

Instructor, CEE 325: Environmental Engineering Materials

Semesters: Spring 2021, Spring 2023, Spring 2024.

Instructor, CEE 629: Membrane Science and Technology

Semesters: Spring 2020, Fall 2021, Fall 2023.

OUTREACH AND EDUCATIONAL ACTIVITIES

At UW-Madison

Environmental Chemistry & Technology Academic Planning Committee chair, 2024-present

Faculty advisor for Engineers for a Sustainable World (ESW), 2023-present

Water@UW-Madison Executive Committee, 2023 – present

Faculty advisor for the Society of Women Engineers (SWE), 2022-present

CEE Becker travel supplement manager, 2022 – present

CEE alternate senator for the Faculty Senate, 2022 – present

Undergraduate Research Scholar (URS) mentor, 2021 – current

Beyond UW-Madison

Volunteer teacher for Science Olympiad team of Middleton West High School, 2022.09 –2023.05

USA International Water Association (IWA) Young Water Professionals (YWP) Chapter treasurer, 2021 – present

Conference Organization

Session Chair, Oral Presentation Session 4: Membrane Distillation: Process Innovation and Integration, 10th International Water Association Membrane Technology Conference, St. Louis, July 24, 2023.

Session Chair, Oral Presentation Session 8: Electric/Thermal Membranes: Process Innovation and Integration, 10th International Water Association Membrane Technology Conference, St. Louis, July 24, 2023.

Session Co-Chair, Oral Presentation Session. Women in Science and Engineering (WISE): Biological and Chemical Processes and Interactions for Water Treatment. The American Chemical Society (ACS) Fall 2023 National Meeting & Exposition, San Francisco, August 15, 2023.

Student Poster Judged

Poster judge, 2023 AEESP Research & Education Conference, June 20-23, 2023.

Poster judge, Chinese-American Professors in Environmental Engineering and Science (CAPEES) poster competition, July 16, 2021.

EDITORSHIP

2024-present Early Career Editorial Advisory Board of ACS ES&T Engineering

2024-present Editor for Desalination and Water Treatment

November 2022 Guest editor for special issue “Valuable resources in water: why and how

to recover?" in Resources, Conservation & Recycling Advances (Volume 15)

AWARDS

- VA AWWA Graduate Student Scholarship, 2017
- Via Teaching Fellow, 2017
- 1st Place for Wastewater Presentation in Water JAM 2016
- The Graduate Student Assembly Travel Fund, 2016
- 2015 Innovation Award for Best Technological Advancement from International Society for Microbial Electrochemistry and Technology (ISMET)
- Finalist in BIG Pitch competition sponsored by Ocean Exchange and South Georgia University. 2015

MEDIA OUTREACH

"Changing the game". March/April 2024. [Manure Manager](#)

"Electrochemical Technique Promises Low-Cost, Low-Emission Fertilizer Recovery". March 2024. [Water Environment & Technology](#)

"Cheap electricity could recycle animal waste, recover valuable chemicals". Dec. 2023. [Science News](#)

"Electrochemical technique gathers valuable nutrients from manure". Dec. 2023. [C&EN](#)

"Tech recovers ammonia, potassium ions from wastewater for fertilizers". Dec. 2023. [Interesting Engineering](#)

"Study details new method for extracting useful nutrients from manure". Dec. 2023. [WisBusiness News](#)

"Zapping manure with special electrode promises an efficient method to produce fertilizers, other chemicals". Dec. 2023. [UW-Madison News](#)

"One-of-a-kind environmental engineering class overflows with real-world examples". Mar. 2023. [UW CoE News](#)

"UW-Madison professors to study microplastics in Great Lakes, say research is 'underexplored'". Sept. 2022. [Wisconsin Public Radio](#)

"Investigating how microplastics travel through the Great Lakes and beyond". Aug. 2022. [UW CoE News](#)