



## Dr. Shaily Mahendra

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Dr. Shaily Mahendra is an Associate Professor in the Department of Civil and Environmental Engineering, and Samueli Fellow at the University of California, Los Angeles. She is a member of the California NanoSystems Institute, Institute of the Environment and Sustainability, and the Molecular Toxicology Program. Shaily received Ph.D. from University of California, Berkeley, where she was advised by Dr. Lisa Alvarez-Cohen. For two years, she was a research scientist in Dr. Pedro Alvarez's group at Rice University in Houston, Texas.

The overarching goals of her research are to understand and control microbiological processes in natural and engineered systems. Shaily also develops novel environmental applications of nanomaterials and technologies for biotransformation of water contaminants. These technologies can greatly decrease the time and cost required to monitor and clean contaminated water, and enable the application of effective risk management strategies. She uses massively parallel DNA and RNA sequencing, real-time PCR, microarrays, high-throughput screening assays, and isotope ratio mass spectrometry in environmental microbiology. Applications of this research are in sustainable treatment of drinking water, groundwater, industrial and municipal wastewater, and recycled and reclaimed water.

Dr. Mahendra has obtained support from the US National Science Foundation, Strategic Environmental Research and Development Program, Air Force Civil Engineer Center, and various industry sponsors for research on emerging contaminants, such as 1,4-dioxane, per- and polyfluoroalkyl substances, nanoparticles, pesticides, antibiotics, and bisphenol analogs. She has produced 41 peer-reviewed papers, 7 book chapters, 3 intellectual property disclosures, 66 invited talks, and 125 conference presentations.

Shaily received the National Science Foundation CAREER Award, DuPont Young Professor Award, Water Environment & Reuse Foundation Paul L. Busch Award, Northrop Grumman Excellence in Teaching Award, Hellman Fellowship, Poptech Science and Public Leadership Fellowship, and Environmental Science & Technology Excellence in Review Award, and was cited as one of the 10 Trendsetters of 2010 by Public Works Magazine. She won the 2008 CH2M-Hill/AEESP Outstanding Doctoral Dissertation Award and advised the recipient of 2016 MWH/AEESP Master's Thesis Award.

She has supervised three postdoctoral scholars, who are currently faculty members in the US and China. Nearly all of her 8 PhD and 7 MS advisees have won competitive scholarships and awards. More than 35 undergraduate students and 10 high school students have participated in her research laboratory. She is committed to broadening the participation of women and underrepresented groups in Environmental Engineering.

Shaily serves on the Board of Directors of the Association of Environmental Engineering and Science Professors and on the Editorial Advisory Boards of Environmental Science and Technology, Applied Biochemistry and Biotechnology, and Environmental Pollution. She serves as ad-hoc reviewer for 33 journals, and as a reviewer or panelist for 10 federal and state agencies. Shaily has chaired technical sessions and served on steering committees at 14 conferences. She has been a Principal Investigator with the University Consortium since 2016.

# Selected Papers and Theses

## Selected Publications

- Myers, M., N. W. Johnson, E. Zerecero-Marin, P. Pornwongthong, Y. Liu, P. B. Gedalanga, and S. Mahendra (2018). Abiotic and Bioaugmented Granular Activated Carbon for the Treatment of 1,4-Dioxane-Contaminated Water. *Environmental Pollution* (in press).
- Miao, Y., N. W. Johnson, K. Heck, S. Guo, C. D. Powell, T. Phan, P. B. Gedalanga, D. T. Adamson, C. J. Newell, M. S. Wong, and S. Mahendra (2018). Microbial Responses to Combined Oxidation and Catalysis Treatment of 1,4-Dioxane and Co-Contaminants in Groundwater and Soil. *Frontiers of Environmental Science and Engineering* (in press).
- Merino, N., M. Wang, R. Ambrocio, K. Mak, E. O'Connor, A. Gao, E. Hawley, R. A. Deeb, L. Y. Tseng, and S. Mahendra (2018). Fungal Biotransformation of 6:2 Fluorotelomer Alcohol. *Remediation Journal* 28(2): 59-70.
- Safdari, M. S., H. R. Kariminia, M. Rahmati, F. Fazlollahi, A. Polasko, S. Mahendra, W. V. Wilding, and T. H. Fletcher (2018). Development of Bioreactors for Comparative Studies of Natural Attenuation, Biostimulation, and Bioaugmentation of Petroleum Hydrocarbon-Contaminated Soil. *Journal of Hazardous Materials* 342: 270-278.
- Zhang, S., P. B. Gedalanga, and S. Mahendra (2017). Advances in Bioremediation of 1,4-Dioxane-Contaminated Waters. *Journal of Environmental Management* 204 (2): 765-774.
- Jasmann, J., P. B. Gedalanga, T. Borch, S. Mahendra, and J. Blotvogel (2017). Synergistic Treatment of Mixed 1,4-Dioxane and Chlorinated Solvent Contaminations by Coupling Electrochemical Oxidation with Aerobic Biodegradation. *Environmental Science & Technology* 51: 12619-12629.
- Gedalanga, P. B., A. Madison, Y. Miao, T. Richards, J. Hatton, W. H. DiGuseppi, J. Wilson, and S. Mahendra (2016). A Multiple Lines of Evidence Framework to Evaluate Intrinsic Biodegradation of 1,4-Dioxane. *Remediation Journal* 27 (1): 93-114.
- Zhang, S., P. B. Gedalanga, and S. Mahendra (2016). Biodegradation Kinetics of 1,4-Dioxane in Chlorinated Solvent Mixtures. *Environmental Science & Technology* 50 (17): 9599-9607.
- Merino, N., Y. Qu, R. A. Deeb, E. L. Hawley, M. R. Hoffmann, and S. Mahendra (2016). Degradation and Removal Methods for Perfluoroalkyl and Polyfluoroalkyl Substances (PFASs) in Water. *Environmental Engineering Science* 33 (9): 615-649.
- Wang, M., D. Abad, V. Kickhofer, L. Rome, and S. Mahendra (2015). Vault Nanoparticles Packaged with Enzymes as a New Pollutant Biodegradation Technology. *ACS Nano* 9 (11): 10931-10940.
- Adamson, D. T., R. H. Anderson, S. Mahendra, and C. J. Newell (2015). Evidence of 1,4-Dioxane Attenuation at Groundwater Sites Contaminated with Chlorinated Solvents and 1,4-Dioxane. *Environmental Science & Technology* 49 (11): 6510-6518.
- Reyes, V. C., S. O. Opot, and S. Mahendra (2015). Planktonic and Biofilm Grown Nitrogen Cycling Bacteria Exhibit Different Susceptibilities to Copper Nanoparticles. *Environmental Toxicology & Chemistry* 34 (4): 887-897.
- Tseng, N., N. Wang, B. Szostek, and S. Mahendra (2014). Biotransformation of 6:2 Fluorotelomer alcohol (6:2 FTOH) by the wood-rotting fungus *Phanerochaete chrysosporium*. *Environmental Science & Technology* 48 (7): 4012-4020.
- Pornwongthong, P., A. Mulchandani, P. B. Gedalanga, and S. Mahendra (2014). Transition Metals and Organic Ligands Influence Biodegradation of 1,4-Dioxane. *Applied Biochemistry and Biotechnology* 173 (1): 291-306.
- Adamson, D. T., S. Mahendra, K. L. Walker, S. R. Rauch, S. Sengupta, and C. J. Newell (2014). A Multi-Site Survey to Identify the Scale of the 1,4-Dioxane Problem at Contaminated Groundwater Sites. *Environmental Science & Technology Letters* 1 (5): 254-258.
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- Gedalanga, P. B., P. Pornwongthong, R. Mora, S.-Y. D. Chiang, B. Baldwin, D. Ogles, and S. Mahendra (2014). Identification of Biomarker Genes to Predict Biodegradation of 1,4-Dioxane. *Applied and Environmental Microbiology* 80 (10): 3209-3218.
- Mahendra, S., A. Grostern, and L. Alvarez-Cohen (2013). The Impact of Chlorinated Solvent Co-contaminants on the Biodegradation Kinetics of 1,4-Dioxane. *Chemosphere* 91 (1): 88-92.
- Chiang, S.-Y. D., R. Mora, W. H. DiGuseppi, G. Davis, K. Sublette, P. B. Gedalanga, and S. Mahendra (2012). Characterizing the Intrinsic Bioremediation Potential of 1,4-Dioxane and Trichloroethene Using Innovative Environmental Diagnostic Tools. *Journal of Environmental Monitoring* 14 (9): 2317-2326.
- Sales, C. M. #, S. Mahendra #, A. Grostern, R. E. Parales, L. A. Goodwin, T. Woyke, M. Nolan, A. Lapidus, O. Chertkov, G. Ovchinnikova, A. Szcyrba, and L. Alvarez-Cohen (2011). Genome sequence of 1,4-dioxane degrading *Pseudonocardia dioxanivorans* CB1190. *Journal of Bacteriology* 193 (17): 4549-4550. #co-first authors.
- Lee, J., S. Mahendra, and P. J. Alvarez (2010). Nanomaterials in the Construction Industry: A Review of Their Applications and Environmental Health and Safety Considerations. *ACS Nano* 4 (7): 3580-3590.
- Li, M., S. Fiorenza, J. Chatham, S. Mahendra, P. J. Alvarez (2010). 1,4-Dioxane biodegradation at low temperatures in Arctic groundwater samples. *Water Research* 44 (9): 2894-2990.
- Xiu, Z-M, Z-H Jin, T-L Li, S. Mahendra, G. V. Lowry, and P. J. Alvarez (2010). Effect of Nanoscale Zero Valent Iron Particles on a Mixed Culture Dechlorinating Trichloroethylene. *Bioresource Technology* 101: 1141-1146.
- Mahendra, S., H. Zhu, V. L. Colvin, and P. J. Alvarez (2008). Quantum Dot Weathering Results in Microbial Toxicity. *Environmental Science & Technology* 42: 9424-9430.
- Klaine, S. J., P. J. Alvarez, G. E. Batley, T. F. Fernandes, R. D. Handy, D. Y. Lyon, S. Mahendra, M. J. McLaughlin, and J. R. Lead (2008). Nanomaterials in the Environment: Behavior, Fate, Bioavailability, and Effects. *Environmental Toxicology & Chemistry* 27 (9): 1825-1851.
- Mahendra, S., C. J. Petzold, E. E. Baidoo, J. D. Keasling, and L. Alvarez-Cohen (2007). Identification of the Intermediates and End-products of 1,4-Dioxane Biodegradation by Monoxygenase-expressing Bacteria. *Environmental Science & Technology* 41 (21): 7330 - 7336.
- Mahendra, S. and L. Alvarez-Cohen (2006). Kinetics of 1,4-Dioxane Biodegradation by Monoxygenase-expressing Bacteria. *Environmental Science & Technology* 40 (17): 5435 - 5442.
- Mahendra, S. and L. Alvarez-Cohen (2005). *Pseudonocardia dioxanivorans* sp. nov., a Novel Actinomycete that Grows on 1,4-Dioxane. *International Journal of Systematic and Evolutionary Microbiology* 55 (2): 593-598.
- Chu, K. H., S. Mahendra, D. L. Song, M. E. Conrad, and L. Alvarez-Cohen (2004). Stable Carbon Isotope Fractionation during Aerobic Biodegradation of Chlorinated Ethenes. *Environmental Science & Technology* 38 (11): 3126 - 3130.

## Recent Theses

Zhang, S. (2017). Biodegradation of 1,4-Dioxane in Chlorinated Solvent Mixtures.

Merino, N. (2016). Fungal Biotransformation of Polyfluoroalkyl Substances: Identification of Growth Substrates for Favorable Biodegradation Pathways.

Reyes, V. C. (2014). Differential Sensitivity of Environmentally Relevant Microorganisms to Metal-containing Nanoparticles.

Pornwongthong, P. (2014). Stable Isotopic and Molecular Biological Tools to Validate Biodegradation of 1,4-Dioxane.