

FAN WU, PhD

Postdoctoral Fellow, Environmental Engineering, University of Wisconsin-Madison |

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Education

- 06/2017 **Doctor of Philosophy, Environmental Engineering**
School of Chemical, Biological, and Environmental Engineering, Oregon State University, Corvallis, OR
Dissertation: *Novel approaches to evaluate the environmental impacts of nanomaterials*
- 07/2011 **Bachelor of Engineering, Environmental Engineering**
School of Chemical and Material Science, South-Central University for Nationalities, Wuhan, China
Thesis: *Acid/base modified rice hulls remediate heavy metals from industrial wastewater*

Professional Experience

- 01/2018 – Present **Postdoctoral Fellow:** Department of Civil and Environmental Engineering, University of Wisconsin-Madison
- Investigate the sustainability of emerging technologies (nanotechnology; nutrient recovery from manure waste; food-energy-water nexus)
 - Examine personal care products as a source of TiO₂ entering the wastewater stream
 - Write research proposals, research articles, teach lectures, and supervise graduate and undergraduate students
- 06/2017 – 12/2017 **Research Fellow**, Oregon Bioscience Association; Costanoan Biotechnologies; College of Veterinary Medicine, Oregon State University
- Synthesized nanoscale polyester beads using *E.coli*
 - Investigated the applications of bio-synthesized nano-beads in protein collection and cancer therapeutics
 - Mentoring, proposal writing, assay development
- 04/2013 – 06/2017 **Research Assistant**, School of Chemical, Biological and Environmental Engineering, Environmental and Molecular Toxicology, Oregon State University
- Developed a rapid and cost-effective microcosm assay to systematically evaluate the fate and environmental impacts of nanomaterials in aquatic ecosystems
 - Collaborated with Center for Sustainable Materials Chemistry at OSU to develop an environmentally friendly organotin semi-conductor thin film
 - Wrote scientific publications; gave over 10 presentations at research conferences
- 09/2013 – 06/2014 **Teaching Assistant**, School of Chemical, Biological and Environmental Engineering, Oregon State University
- Fate and transport of chemicals in environment systems (ENVE 422/522)

- Fundamentals of environmental engineering (ENVE 322)
- Sustainable Engineering (ENGR 350)
- Guest lectured classes: Fate and transport of chemicals in environment systems

Current Research Interests

<i>Sustainability</i>	Investigate the sustainability of emerging technologies, including nanotechnologies, nutrient recovery, and aquaponics
<i>Emerging Contaminants</i>	Characterize the fate and transport of emerging contaminants in complex environmental matrices; assess the impacts of emerging contaminants to protect the environmental health.

Publications

1. **Fan Wu**; Zheng Zhou; Andrea L. Hicks. *Life cycle impact of titanium dioxide nanoparticle synthesis through physical, chemical, and biological routes. (Environmental Science & Technology, 2019, DOI: 10.1021/acs.est.8b06800)*
2. **Fan Wu**; Ramin Ghamkhar; Weslyne Ashton, Andrea L. Hicks. *Reducing the environmental impact of seafood and produce production – aquaponics as an emerging technology (Integrated Environmental Assessment and Management, 2019, accepted)*
3. **Fan Wu**; Bryan J. Harper; Stacey L. Harper. *Comparison of the dissolution, uptake and toxicity of nano- and micron-sized zinc oxide particles. (Environmental Toxicology & Chemistry, 2019, 38(3), 591-602)*
4. Lindsay Denluck; **Fan Wu**; Bryan J. Harper; Stacey L. Harper. *Reactive oxygen species are likely driven copper-based nanomaterials toxicity. (Environmental Science: Nano, 2018, 5(6), 1473-1481)*
5. **Fan Wu**; Bryan J. Harper; Stacey L. Harper. *Differential dissolution and toxicity of surface functionalized silver nanoparticles in small-scale microcosms: impacts of community complexity. (Environmental Science: Nano, 2017, 4, 359-372)*
6. **Fan Wu**; Amy E. Bortvedt; Bryan J. Harper; Lauren E. Crandon; Stacey L. Harper. *Uptake and toxicity of CuO nanoparticles to Daphnia magna varies between indirect dietary and direct waterborne exposures. (Aquatic Toxicology, 2017, 190, 78-86)*

In review:

Fan Wu; Matt Seib; Andrea L. Hicks. *A citizen science approach estimating titanium dioxide released from personal care products. (Proceedings of the National Academy of Sciences of the United States of America)*

Fan Wu; Bryan J. Harper; David A. Marsh; Sumit Saha; Jenn M. Amador; J. Trey Diulus; Douglas A. Keszler; Gregory S. Herman; Bettye L.S. Maddux; Stacey L. Harper. *Monoalkyl tin nano-cluster*

films reveal a low environmental impact under simulated natural conditions. (Beilstein Journal of Nanotechnology)

Ramin Ghamkhar; Christopher Hartleb; **Fan Wu**; Andrea L. Hicks. *Life Cycle Assessment of a Cold Weather Aquaponic Food Production System (Journal of Cleaner Production)*

In prep:

Fan Wu; Zheng Zhou; Andrea L. Hicks. *Environmental payback and life cycle impact of novel carbon dioxide capture technologies.*

Fan Wu; Bryan J. Harper; Stacey L. Harper. *Evaluation of Cu and CuO nanoparticle environmental impacts using laboratory small scale microcosms.*

Fan Wu; Andrea L. Hicks. *Case-dependent characterization factors for nanoscale titanium dioxide in life cycle assessment.*

Professional Services

11/2015 – 11/2016 ***Student At-Large***, Society of Environmental Toxicology and Chemistry - Pacific Northwest (SETAC-PNW)

11/2015 – 11/2016 ***Student Advisory Council Member***, Society of Environmental Toxicology and Chemistry - North America (SETCA-NA)

11/2015 – 06/2017 ***Student Representative***, Nanotechnology Advisory Group, SETCA-NA

Student Advising

- Currently advising 3 undergraduate students in Civil and Environmental Engineering
- Successfully mentored 11 undergraduate researchers and 3 graduate students in Harper nanotoxicology laboratory from 2014 to 2017

Skills

- **Instrumentation:** Inductively Coupled Plasma Mass Spectrometry and Optical Emission Spectrometry, Hyperspectral Imaging, Flow Cytometer, Scanning Electron Microscopy, Gas Chromatography, Dynamic Light Scattering, Nanoparticle Tracking Analysis, UV-Vis Spectroscopy, AKTA purifier
- **Languages:** English and Chinese
- **Laboratory Cultures:** *D. magna*, *C. reinhardtii*, *C. vulgaris*, *E. coli* and other bacterium,
- **Programs:** SimaPro, R, SigmaPlot, MATLAB, ImageJ, Microsoft Office

Awards

- 06/2017 Oregon Bioscience Association Research Fellowship
- 11/2016 SETAC-North America (Orlando, FL), Student Award

- 01/2016 7th Environment & Molecular Toxicology Research Day, Presentation Award (3rd)
- 11/2015 Sustainable Nanotechnology Organization (SNO), Student Award
- 11/2015 SETAC-North America (Salt Lake City, UT), Student Award
- 05/2015 SETAC-Pacific Northwest (Portland, OR), Presentation Award (1st)
- 05/2015 PNW-SETAC (Portland, OR), Student Award
- 11/2014 SETAC-North America (Vancouver, BC), Student Award

Panels, Presentations, and Published Proceedings

Invited Panelist:

- 11/2014 “*Navigating the Graduate Student Experience: International Students*”
Hosted by Graduate School at Oregon State University
- 11/2015 “*Graduate student panel*” Hosted by School of Chemical, Biological and Environmental Engineering at Oregon State University

Platform and poster presentations:

- 03/23/2019 27th SETAC-Midwest Annual Meeting. La Crosse, WI (Platform & Poster)
- 11/05/2018 39th SETAC-North America Annual Meeting. Sacramento, CA (Platform & Poster)
- 06/28/2018 25th International Symposium on Sustainable Systems and Technology. Buffalo, NY (Platform)
- 01/20/2017 8th Environment & Molecular Toxicology Research Day. Corvallis, OR (Poster)
- 11/07/2016 7th SETAC World Congress. Orlando, FL (Platform)
- 06/02/2016 25th SETAC- Pacific Northwest Annual Meeting. Bellingham, WA (Platform)
- 01/22/2016 7th Environment & Molecular Toxicology Research Day. Corvallis, OR (Poster)
- 11/09/2015 4th Sustainable Nanotechnology Organization Conference. Portland, OR (Poster)
- 11/03/2015 36th SETAC-North America Annual Meeting. Salt Lake City, UT (Platform)
- 05/11/2015 24th SETAC- Pacific Northwest Annual Meeting. Portland, OR (Poster)
- 05/04/2015 1st Oregon State University Graduate Research Expo. Portland, OR (Poster)
- 01/09/2015 6th Environment & Molecular Toxicology Research Day. Corvallis, OR (Poster)
- 11/03/2014 35th SETAC-North America Annual Meeting. Vancouver, BC, Canada (Poster)

Published Proceedings:

Fan Wu; Andrea L. Hicks. Estimated release of titanium dioxide from personal care products entering wastewater treatment plants. (SETAC-NA, Sacramento, CA, 2018)

Fan Wu; Andrea L. Hicks. Nano-titanium dioxide enabled products - a review of current status and beyond from a life cycle perspective. (SETAC-NA, Sacramento, CA, 2018)

Andrea L. Hicks; **Fan Wu.** Life cycle assessment of aquaponics and agriculture informed by literature review. (SETAC-NA, Sacramento, CA, 2018)

Fan Wu; Sumit Saha; Bryan Harper; Douglas Keszler; Bettye Maddux; Stacey Harper. Alternative organotin clusters for thin films: Low environmental impacts under simulated environmental conditions. (ACS, San Francisco, CA, 2017)

Fan Wu; Amy E. Bortvedt; Bryan J. Harper; Lauren E. Crandon; Stacey L. Harper. Differential uptake and toxicity of CuO nanoparticle to *Daphnia magna* from chronic exposure using two delivery scenarios. (SETAC-NA, Orlando, FL, 2016)

Lauren E. Crandon; **Fan Wu**; Arek Engstrom; Stacey L. Harper. Determining aggregation behavior and corresponding surface reactivity of copper oxide nanoparticles using a rapid colorimetric assay. (SETAC-NA, Orlando, FL, 2016)

Abbas Gungordu; Nesrin Ozmen; Meltem Asilturk; **Fan Wu**; Sema Erdemoglu; Sengul Yuksel; Stacey L. Harper; Murat Ozmen. Evaluation toxic and teratogenic effects of core-shell nano-TiO₂ at different trophic levels. (International Congress Nanotechnology in Biology & Medicine, Krems, Austria, 2016)

Fan Wu; Bryan J. Harper; Stacey L. Harper. Differential dissolution and toxicity of surface functionalized silver nanoparticles in small-scale microcosms: impacts of community complexity. (SETAC-NA, Salt Lake City, UT, 2015)

Fan Wu; Bryan J. Harper; Jino Son; Stacey L. Harper. Differential responses of single species and mixed community exposures to environmentally relevant concentrations of zinc oxide nanoparticles. (SETAC-NA, Vancouver, BC, 2014)

Professional Society

- Society of Environmental Toxicology and Chemistry (SETAC)
- Sustainable Nanotechnology Organization (SNO)
- International Society of Industrial Ecology (ISIE)
- International Symposium on Sustainable Systems and Technology (ISSST)
- Regional SETAC