JARED S. BOZICH, Lead Environmental Toxicologist (PhD)

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AFFILIATION
International Flavors and Fragrances (IFF)

EDUCATION
University of Wisconsin Milwaukee (UWM) School of Freshwater Sciences, Milwaukee, WI
Ph.D. Freshwater Sciences 2016
Dissertation: "The Impact of Nanomaterial Functionalization on Toxicity to *Daphnia magna*"

UWM, Milwaukee, WI
B.S. Conservation and Environmental Sciences 2012
Areas of Concentration: Toxicology, Environmental Health, Biology, Sustainable Development and Contaminant Hydrology

EXPERIENCE
Chair of International Fragrance Association Environmental Task Force
2021-Present
- Lead group of technical experts to address regulatory and industry issues in the area of environmental sciences

Research Institute for Fragrance Materials Environmental Core Team
2016-Present
- Guide industry hazard and exposure assessments of fragrance ingredients (I.e., Persistence, bioaccumulation and toxicity)
- Develop and improve approaches to aquatic risk assessment

International Flavors and Fragrances (Supervisor: Dr. Xing Han, Vice President of Toxicology and Risk Assessment)
Lead Environmental Toxicologist 2016-Present
- Technical expert in supporting R&D projects and biodegradation, bioaccumulation, ecotoxicology and environmental risk assessment
- Develop environmental fate and safety evaluation program for fragrance encapsulation technologies
- Explore technical advancements to meet corporate sustainability goals in improving biodegradability of IFF technologies
- Support global registration of IFF products using expertise in environmental toxicology and environmental risk assessment, especially for challenging regulatory programs such as EU REACH and US TSCA
- Interface with industry trade associations as a company technical representative in areas of environmental toxicology and biodegradability
- Directly work with technical counterparts in customer companies to assist their environmental safety evaluation program

School of Freshwater Sciences, UWM, Milwaukee, WI (Supervisor: Dr. Rebecca Klaper, School of Freshwater Sciences)
Research Associate 2012 – 2016
- Design and implement whole organism aquatic toxicology experiments and analyze data to provide environmental hazard assessments for emerging chemicals of concern and difficult substances
- Link nanomaterial properties to toxicity in aquatic environments to aid nanomaterial redesign and help create environmentally benign nanotechnologies
- Explore molecular biomarkers using gene expression assays as a method to rapidly screen nanomaterials for toxicity
- Form partnerships across research disciplines and communicate technical research to diverse audiences

BASF SE, Ludwigshafen, Germany (Supervisor: Dr. Edward Salinas, Experimental Ecotoxicology)
Student Internship Fall, 2015
- Assessed the influence of part per billion variations of natural organic carbon levels and water hardness on cationic polymer acute toxicity to *Daphnia magna*
- Identified critical variables to enhance the interpretability and reliability of regulatory aquatic toxicity tests used for environmental hazard assessment
- Demonstrated an alternative to vertebrate testing to assess the mitigation potential of organic carbon to cationic polymer toxicity
- Performed in parallel with GLP studies in an industry ecotoxicology laboratory

School of Freshwater Sciences, UWM, Milwaukee, WI (Supervisor: Dr. Rebecca Klaper, School of Freshwater Sciences)
Laboratory Technician Summer, 2012

- Oversaw fish and invertebrate breeding facilities, maintained *Daphnia magna* cultures and successfully bred *Pimephales promelas* (fathead minnows) for research purposes
- Performed fish dissections (gonad, liver, brain and blood extraction), blood analyses, RNA extractions
- Mentored undergraduate researchers

Department of Biological Sciences, UWM, Milwaukee, WI (Supervisor: Dr. Timothy Ehlinger, Department of Biological Sciences)
Undergraduate Researcher 2011 – 2012

- Assisted an ecological restoration project in SE WI and sediment toxicity-screening project
- Performed habitat assessments, fish surveys, sediment collection and processing and *Danio rerio* (zebra fish) embryo teratogenicity assays
- Identified potential confounding factors in sediment toxicity tests using zebra fish embryos
- Conducted an independent research project investigating the impacts of sediment oxygen demand to zebra fish embryo sediment toxicity tests

PUBLICATIONS

1. Arielle, C., and Leili Zhang et al. 2017. *Lipid Corona Formation from Nanoparticle Interactions with Bilayers and Membrane-Specific Biological Outcomes*. https://s3-eu-west-1.amazonaws.com/itempdf74155353254prod/5512996/Lipid_Corona_Formation_from_Nanoparticle_Interactions_with_Bilayers_and_Membrane-Specific_Biological_Outcomes_v1.pdf
2. L.L. Olenick, et al. 2018. *Lipid Corona Formation from Nanoparticle Interactions with Bilayers Chem* 4.11: 2709-2723 https://www.sciencedirect.com/science/article/abs/pii/S2451929418304388
3. J.S. Bozich, M. Hang, R.J. Hamers, R.D. Klaper. 2017. *Acute and chronic toxicity of a battery nanomaterial, lithium nickel manganese cobalt oxide to Daphnia magna*. Environmental toxicology and chemistry 36:9 https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.3791
4. S. Bowman and J.S. Bozich. 2015. *Internet-Based Platforms for Science Communication*. Integrated Environmental Assessment and Management: Learned Discourse. IEAM 11(3). http://onlinelibrary.wiley.com/doi/10.1002/ieam.1650/full
5. J.S. Bozich, T.A. Qiu, et al. 2015. *Gene expression as an indicator of the molecular response and toxicity of the Gram-negative bacterium Shewanella oneidensis and the water flea Daphnia magna exposed to positively and negatively surface functionalized gold nanoparticles*. Environmental Science: Nano 2:615-629 http://pubs.rsc.org/en/Content/ArticleLanding/2015/EN/C5EN00037H - !divAbstract
6. J.S. Bozich, S.E. Lohse, M.D. Torelli, C.J. Murphy, R.J. Hamers, R.D. Klaper. 2014. *Surface chemistry, charge and ligand type impact the toxicity of gold nanoparticles to Daphnia magna*. Environmental Science: Nano 1:260-270. http://pubs.rsc.org/en/Content/ArticleLanding/2014/EN/C4EN00006D - !divAbstract
7. R.D. Klaper, D. Arndt, J.S Bozich, G. Dominguez. 2014. *Molecular interactions of nanomaterials and organisms: defining biomarkers for toxicity and high-throughput screening using traditional and next-generation sequencing approaches.* Analyst 139(5):882-95. http://pubs.rsc.org/en/Content/ArticleLanding/2014/AN/C3AN01644G - !divAbstract

PRESENTATIONS

A. Lapczynski, K. Connors, and **J.S. Bozich**. "*Towards the development of fragrance specific ecological threshold of toxicological concern*". NA SETAC, 2023

K. Connors, A. Lapczynski, and **J.S. Bozich**. "*Development of a chronic OTNE species sensitivity distribution*". NA SETAC, 2023

Chekmarev, D., **Bozich, J**., Huang, X., Bikker, J. "*Practical machine learning model for predicting biodegradability of fragrance materials*", ACS Fall 2022 Meeting Chicago, IL, USA

J.S. Bozich, E.R. Salinas, R. Lukas, L. Peters. *"Assessing the influence of part per billion variation of nautral organic carbon levels on cationic polymer acute toxicity to D. magna".* Midwest SETAC, 2016.

J.S. Bozich, M. Hang, R.J. Hamers, R.D. Klaper *"Mechanisms for toxicity of a next generation energy storage nanomaterial"* Young Environmental Scientists Conference, 2016.

J.S. Bozich, S.E. Lohse, A. Vartanian, L. Jacob, M.D. Torelli, C.J. Murphy, R.J. Hamers, R.D. Klaper. "*Probing the molecular level impacts of functionalized gold nanoparticles to D. magna".* Gordan Research Conference, 2015.

J.S. Bozich, M. Hang, R.J. Hamers, R.D. Klaper "*Impacts of a next generation energy storage material to Daphnia magna*". SETAC Midwest, 2015.

J.S. Bozich, S.E. Lohse, M.D. Torelli, C.J. Murphy, R.J. Hamers, R.D. Klaper "*Impacts of differing diamond and gold nanomaterial surface chemistries on toxicity to Daphnia magna: Defining trends in nanomaterial toxicity*". American Chemical Society, 2014.

J.S. Bozich, L.M. Bishop, A. Tillman, C.L. Haynes, F.M. Geiger, G.A. Orr, C.J. Murphy, J.A. Pederson, L. DeStefano, R.J. Hamers, R.D. Klaper. "*Blogging: A tool for informal communication of scientific research and technology*". SETAC Europe, 2014.

J.S. Bozich, S.E. Lohse, M.D. Torelli, C.J. Murphy, R.J. Hamers, R.D. Klaper. "*Surface chemistry, charge and ligand type impact the toxicity of gold nanoparticles to Daphnia magna".* Midwest SETAC, 2014.
J.S. Bozich and R.D. Klaper. "*It's a Nano World: Nanomaterials in today's world*" Midwest SETAC, 2014.
J.S. Bozich, S.E. Lohse, M.D. Torelli, C.J. Murphy, R.J. Hamers, R.D. Klaper. "*Impacts of differing diamond and gold nanoparticle surface chemistries on toxicity to Daphnia magna".* Dallas ACS, 2014.
J.S. Bozich, D. Arndt, A. Nikolaus, L. M. Bishop, R.J. Hamers, R.D. Klaper "*Noontime Seminar-Blogging about science: Sharing your data in a new way*". SETAC North America, 2013.
J.S. Bozich, S.E. Lohse, C.J. Murphy, R.D. Klaper. "*Chemical and Physical Mechanisms of Gold Nanoparticle Toxicity: Toxicity assay using Daphnia magna".* Indianapolis ACS, 2013.
J.S. Bozich, S.E. Lohse, C.J. Murphy, R.D. Klaper. "*Comparative Toxicity of Nanoparticles with Differing Surface Chemistries*". Midwest SETAC, 2012.
J.S. Bozich, J. Jensen, M. Delinger, T. Ehlinger. *"Determining affects of SOD in acute toxicity assays on Zebra fish embryos".* UWM-Undergraduate research symposium and Bio-Sci symposium, 2011.

AWARDS AND HONORS

Chancellor's Graduate Student and Research Excellence Fellowship (UWM) 2015
Invited session chair "Fate and Effects of Nanomaterials" (Young
Environmental Scientist conference) 2015
SC-Johnson "Best Student-Presentation" award (Midwest Society of Environmental
Toxicology and Chemistry (SETAC)) 2015
Invited poster presentation (North America SETAC) 2015
Invited manuscript (Integrated Environmental Assessment and Management (SETAC)) 2015
Invited platform presentation (Europe SETAC) 2014
Invited seminar (North America SETAC) 2013
Elected student representative for North America Student Advisory
Council and Midwest SETAC 2012
Student Undergraduate Research Fellowship (UWM) 2012
Student Undergraduate Research Fellowship (UWM) 2011