



Exponent[®]
Engineering & Scientific Consulting

Melissa Badding, Ph.D., DABT

Managing Scientist | Health Sciences
1800 Diagonal Road, Suite 500 | Alexandria, VA 22314
(571) 227-7225 tel | mbadding@exponent.com

Professional Profile

Dr. Badding is a board-certified toxicologist and specializes in the toxicological evaluation of chemical exposures and their impacts on human health. Her expertise includes risk assessments for a variety of substances and exposure scenarios, such as agrochemicals, metals, extractable and leachable substances, particulates, and pharmaceuticals. She has conducted evaluations of biocompatibility for medical devices and consumer products and has been involved in assisting clients with regulatory strategies for product testing, including data gap analysis. She also has over 8 years of laboratory research experience in molecular biology and toxicology with an emphasis on metal particulates, including nanoparticles, both in cell culture and rodent models of pulmonary injury.

Prior to joining Exponent, Dr. Badding held the position of Associate Service Fellow at the National Institute for Occupational Safety and Health (CDC/NIOSH), where she performed laboratory research to evaluate the toxicity of particles encountered in the occupational environment. Her work focused on elucidating the mechanisms of particle-related respiratory toxicity for emerging occupational diseases and communicating these findings to multidisciplinary teams for their incorporation into risk and exposure assessments. Dr. Badding received her Ph.D. in Toxicology from the University of Rochester in 2012. Her doctoral work focused on maximizing the intracellular trafficking of plasmid DNA for successful gene transfer. Her thesis work helped to reveal how the microtubule network, transcription factors, and nuclear import proteins play a role in cytoplasmic plasmid transport during non-viral gene therapy.

Dr. Badding is an active member of the Society of Toxicology (SOT), ASTM International, and Women's Council on Energy and the Environment (WCEE) and a past member of the American Society of Gene and Cell Therapy and the American Thoracic Society. She has received numerous awards during her graduate and post-graduate studies, including an award for the best postdoctoral presentation in the area of inhalation and respiratory toxicology at the 2014 SOT meeting, best postdoctoral abstract award from the mixtures specialty section of SOT in 2015, and a best poster award at the 8th Conference on Metal Toxicity and Carcinogenesis.

Academic Credentials & Professional Honors

Ph.D., Toxicology, University of Rochester, 2012

M.S., Toxicology, University of Rochester, 2009

B.S., Biotechnology, Rochester Institute of Technology, summa cum laude, 2007

Postdoctoral Fellow Achievement Award from the Women in Toxicology Special Interest Group, Society of Toxicology, 2015
Best Postdoctoral Abstract Award from the Mixtures Specialty Section, Society of Toxicology, 2015

Best Poster Award, 8th Conference on Metal Toxicity & Carcinogenesis, 2014

Inhalation and Respiratory Specialty Section Postdoctoral Award, Society of Toxicology, 2014

William F. Neuman Award and Scholarship for exemplary scholarship and citizenship, University of Rochester, 2011

New Investigator of the Month, American Society of Gene and Cell Therapy, 2011

Excellence in Research Award given to the top 3 student abstracts, American Society of Gene and Cell Therapy, 2010

Toxicology Scholar Award, given to the most promising incoming graduate student, University of Rochester, 2007-2009

Prior Experience

Associate Service Fellow, Health Effects Laboratory Division, National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC), 2012-2015

Professional Affiliations

Society of Toxicology (2010-present)

- Medical Device and Combination Product Specialty Section (Executive Committee Councilor, 2018-present)
- Inhalation and Respiratory Specialty Section
- Occupational and Public Health Specialty Section (served as postdoctoral representative, 2014-2015)
- Molecular and Systems Biology Specialty Section
- Women in Toxicology Special Interest Group
- Allegheny-Erie Regional Chapter of SOT (2013-2015)

American Board of Toxicology, Diplomate (2016-present)

ASTM International (2018-present)

American College of Toxicology (2016-present)

Women's Council on Energy and the Environment (2015-present)

American Society of Gene and Cell Therapy (2008-2012)

American Thoracic Society (2008-2009)

Publications

Badding, M. A., Vargas, J. R., Fortney, J., Cheng, Q. J., & Ho, C.-H. Toxicological risk assessment of bisphenol a released from dialyzers under simulated-use and exaggerated extraction conditions. *Regulatory Toxicology and Pharmacology*. 2020, 118, 104787. <https://doi.org/10.1016/j.yrtph.2020.104787>

Badding M, Gollapudi BB, Gehen S, Yan Z. In vivo mutagenicity evaluation of the soil fumigant 1,3-

dichloropropene, Mutagenesis, geaa015. Published 16 July 2020.
<https://doi.org/10.1093/mutage/geaa015>

Badding MA, Barraj L, Williams AL, Scrafford C, and Reiss R. CLARITY-BPA Core Study: Analysis for Non-Monotonic Dose-Responses and Biological Relevance. Food and Chemical Toxicology 2019; Published online on June, 15 2019. <https://doi.org/10.1016/j.fct.2019.06.001>.

Stefaniak AB, Virji MA, Badding MA, Cummings KJ. Application of the ICRP respiratory tract model to estimate pulmonary retention of industrially sampled indium-containing dusts. Inhalation Toxicology 49(4):169-178 [Epub 2017 Jun 08]. <http://dx.doi.org/10.1080/08958378.2017.1333548>.

Dunnick KM, Morris AM, Badding MA, Barger M, Stefaniak AB, Sabolsky EM, Leonard SS. Evaluation of the effect of valence state on cerium oxide nanoparticle toxicity following intratracheal instillation in rats. Nanotoxicology 2016; 10(7):992-1000. doi:10.3109/17435390.2016.1157220.

Badding MA, Fix NR, Orandle, MS, Barger MW, Dunnick KM, Cummings KJ, Leonard SS. Pulmonary toxicity of indium-tin oxide production facility particles in rats. Journal of Applied Toxicology 2016. 36(4):618-626. doi: 10.1002/jat.3253. [Epub 2015 Oct 15].

Badding MA, Schwegler-Berry D, Park J-H, Fix NR, Cummings KJ, Leonard SS. Sintered indium-tin oxide particles induce pro-inflammatory responses in vitro, in part through inflammasome activation. PLoS ONE 2015; 10(4):e0124368. doi: 10.1371/journal.pone.0124368.

Badding MA, Stefaniak AB, Fix NR, Cummings KJ, Leonard SS. Cytotoxicity and characterization of particles collected from an indium-tin oxide production facility. Journal of Toxicology and Environmental Health Part A 2014; 77(20):1193-1209. doi: 10.1080/15287394.2014.920757.

Dunnick KM, Badding MA, Schwegler-Berry DE, Patete J, Wong S, Leonard SS. The effect of tungstate nanoparticles on reactive oxygen species and cytotoxicity in RAW 264.7 mouse monocyte macrophage cells. Journal of Toxicology and Environmental Health Part A 2014; 77(20):1251-1268. doi: 10.1080/15287394.2014.897490.

Badding MA, Fix NR, Antonini JM, Leonard SS. A comparison of cytotoxicity and oxidative stress from welding fumes generated with a new nickel-, copper-based consumable versus mild and stainless steel-based welding in RAW 264.7 mouse macrophages. PLoS ONE 2014; 9(6):e101310. doi: 10.1371/journal.pone.0101310.

Antonini JM, Badding MA, Meighan TG, Keane M, Leonard SS, Roberts JR. Evaluation of the pulmonary toxicity of a fume generated from a nickel-, copper-based electrode to be used as a substitute in stainless steel welding. Environmental Health Insight 2014; 8(S1):11-20. doi: 10.4137/EHI.S15260.

Badding MA, Lapek Jr JD, Friedman AE, Dean DA. Proteomic and functional analyses of protein-DNA complexes during gene transfer. Molecular Therapy 2013; 21(4):775-785. doi: 10.1038/mt.2012.231.

Badding MA, Dean DA. Highly acetylated tubulin permits enhanced interactions with and trafficking of plasmids along microtubules. Gene Therapy 2013; 20(6):616-624. doi: 10.1038/gt.2012.77. [Epub 2012 Sep 27].

Cramer F, Christensen CL, Poulsen TT, Badding MA, Dean DA, Poulsen HS. Insertion of a nuclear factor kappa B DNA nuclear targeting sequence potentiates suicide gene therapy efficacy in both small- and non-small cell lung cancer cell lines. Cancer Gene Therapy 2012; 19(10):675-683. doi: 10.1038/cgt.2012.54. [Epub 2012 Aug 17].

Badding MA, Vaughan EE, Dean DA. Transcription factor plasmid binding modulates microtubule interactions and intracellular trafficking during gene transfer. Gene Therapy 2012; 19(3):338-346. doi:

10.1038/gt.2011.96. [Epub 2011 Jun 30].

Selected Presentations

Badding MA, Barraj L, Williams AL, and Reiss R. CLARITY-BPA Core Study: Analysis for Non-Monotonic Dose-Responses. Presented at the Annual Meeting of the Society of Toxicology, Baltimore, MD. March 2019. Toxicologist (Abstract 3144).

Van Cott A, Frericks M, Hastings C, Honavar N, Flick B, Fabian E, Badding M, Gollapudi B, Bus J, and van Ravenzwaay B. Mode-of-Action Analysis for Uterine Adenocarcinomas Associated with High Dietary Doses of the Insecticide Afdopyropen. Presented at the Annual Meeting of the Society of Toxicology, San Antonio, TX. March 2018. Toxicologist (Abstract 2049).

Garry MR, Badding MA. Health screening of hazardous air pollutant emissions at MSW landfills. Presented at the Annual Meeting of the Society of Toxicology, Baltimore, MD, March 2017. Toxicologist 432:2836.

Badding MA, Fix NR, Orandle, MS, Barger MW, Dunnick KM, Cummings KJ, and Leonard SS. Instillation of indium-tin oxide production facility particles induces pulmonary toxicity in rats. Presented at the Annual Meeting of the Society of Toxicology, New Orleans, LA, March 2016. Toxicologist 74:1314.

Badding MA, Fix NR, Cummings KJ, Leonard SS. Pro-inflammatory responses and inflammasome activation by sintered indium-tin oxide particles. Presented at the Annual Meeting of the Society of Toxicology, San Diego, CA, March 2015. Toxicologist 144:2422.

Badding MA, Fix NR, Cummings KJ, Leonard SS. Cytotoxicity and inflammatory responses induced by particles generated during indium-tin oxide production. Presented at the 8th Conference on Metal Toxicity & Carcinogenesis, Albuquerque, NM, October 2014.

Badding MA, Fix NR, Antonini JM, Leonard SS. A comparison of cytotoxicity and oxidative stress from welding fumes generated with a new nickel-, copper-based consumable versus mild and stainless steel-based welding in RAW 264.7 mouse macrophages. Presented at the Annual Meeting of the Allegheny-Erie Society of Toxicology, Morgantown, WV, May 2014.

Badding MA, Schwegler-Berry DE, Cummings KJ, Leonard SS. Compounds collected from indium-tin oxide production induce inflammatory responses from cultured macrophages and bronchial epithelial cells. Presented at the Annual Meeting of the Society of Toxicology, Phoenix, AZ, March 2014. Toxicologist 138:1208.

Badding MA, Fix NR, Dunnick KM, Cummings KJ, Castranova V, Leonard SS. Evaluation of cellular responses to particles collected from an indium-tin oxide production facility. Presented at the Annual Meeting of the Allegheny-Erie Society of Toxicology, Morgantown, WV, May 2013.

Badding MA, Fix NR, Dunnick KM, Cummings KJ, Castranova V, Leonard SS. Macrophage toxicity in response to particles collected from indium-tin oxide production. Presented at the Annual Meeting of the Society of Toxicology, San Antonio, TX, March 2013. Toxicologist 132:2003.

Peer Reviewer

Toxicological Sciences

Journal of Toxicology and Environmental Health Part A

Journal of Applied Toxicology

