Exponent®
Engineering & Scientific Consulting

Melissa Badding, Ph.D., DABT

Senior Managing Scientist | Health Sciences
Alexandria
+1-571-227-7225 | 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 extractable and leachable substances from medical devices, consumer products, particulates, industrial chemicals, and pharmaceuticals.

She has extensive experience with medical device biocompatibility and assists clients with their regulatory strategy for product testing per ISO 10993 standards, including data gap analysis, chemical characterization risk assessments, biocompatibility evaluation reports, and regulatory deficiency responses. Dr. Badding also has expertise in personal care and consumer product safety and conducts exposure-based risk assessments for human health effects.

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. Dr. Badding received her Ph.D. in Toxicology from the University of Rochester in 2012. Her doctoral work focused on molecular mechanisms of non-viral gene therapy.

Dr. Badding is an active member of the Society of Toxicology (SOT) and Women's Council on Energy, and the Environment (WCEE), and a past member of ASTM International, the American College of Toxicology (ACT), the American Society of Gene and Cell Therapy (ASGCT), and the American Thoracic Society (ATS).

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, 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

Licenses and Certifications

Diplomate of the American Board of Toxicology (DABT)

Academic Appointments

University of Rochester, Biomedical Engineering, Guest Instructor

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, 2018-2020)

• National Capital Area Chapter (Vice President/President-Elect, 2023-present)

• Inhalation and Respiratory Specialty Section

• Occupational and Public Health Specialty Section (postdoctoral representative, 2014-2015)

• Molecular and Systems Biology Specialty Section

• Women in Toxicology Special Interest Group

• National Capital Region Chapter of SOT (2022-present)

• Allegheny-Erie Regional Chapter of SOT (2013-2015)

American Board of Toxicology, Diplomate (2016-present)

ASTM International (2018-2021)

American College of Toxicology (2016-2021)

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 Afidopyropen. 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.