

Melissa J. Vincent, M.S.

SUPERVISING SCIENTIST

CONTACT INFORMATION

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PROFESSIONAL PROFILE

Ms. Melissa Vincent is a Supervising Scientist in ToxStrategies' Health Sciences Practice. She has more than 15 years of applied experience in human health risk assessment and has demonstrated proficiency in the use and application of epidemiology, toxicology, and biostatistics in support of evidence integration and quantitative dose-response assessments. Ms. Vincent has expertise in statistical analysis of epidemiological and toxicological data, and determination of exposure risk and dose-response relationships for both cancer and noncancer outcomes. This includes evaluation of pesticides, food flavorings, consumer products, arsenic, metals (including nickel, hexavalent chromium, and cobalt), and other environmental exposures (including ethylene oxide, formaldehyde, and PFAS). Ms. Vincent applies benchmark dose and meta-regression analysis to derive points of departure, including effective concentrations. These analyses frequently are based on epidemiological information and are conducted with consideration of mode of action in support of model determination.

In her practice, Ms. Vincent utilizes systematic review and risk assessment frameworks for critically evaluating epidemiological evidence for integration with toxicological hazard information. She incorporates uncertainties in dose and response, and the impact of those uncertainties on quantitative risk assessments, through application of Bayesian analysis, bias adjustments, and/or sensitivity analyses. Ms. Vincent has experience with application of USEPA guidance for benchmark dose modeling and has taught many professional continuing education courses regarding the application of these techniques for cancer and noncancer risk assessments.

Ms. Vincent collaborated with biomathematicians in evaluating a variety of data sets for consistency with, or violation of, dose addition, work that earned an Honorable Mention for the US Environmental Protection Agency's Scientific and Technical Achievement Award.

EDUCATION AND DEGREES EARNED

- 2013 Master of Science (MS), Epidemiology
University of Cincinnati
- 2007 Bachelor of Arts (BA), Zoology
Miami University

PROFESSIONAL HONORS/AWARDS

- 2022 Society of Toxicology Risk Assessment Specialty Section; Top Ten Abstract Award, “Risk assessment of organic impurities detected in hand sanitizers marketed to children during the COVID-19 pandemic.”
- 2015 US Environmental Protection Agency Scientific and Technological Achievement Award (STAA)—Honorable Mention
- 2008 Society of Risk Analysis; Best Poster Award, “The effects of acute exposure to methyl isothiocyanate (MITC).”

PROFESSIONAL ASSOCIATIONS

- Society for Risk Analysis
- Society for Epidemiologic Research

SELECTED PROFESSIONAL EXPERIENCE

Risk Assessment and Quantitative Dose-Response Assessment

Applied systematic review methods, including risk-of-bias assessment and formal integration of epidemiological and toxicological evidence (with an emphasis on biological plausibility), to evaluate the likelihood that observed associations between inhalation of formaldehyde and development of lymphohematopoietic cancers are causal.

Supported derivation of inhalation unit risk estimates for hexavalent chromium based on updated lung cancer mortality information from an aerospace manufacturing facility. Mortality information across three separate cohorts was pooled to examine cumulative exposure response across a broader range of exposures to incorporate explanatory variables such as smoking, and inform dose-response shape in the lower-dose region.

Investigated acute human exposure to the pesticide methyl isothiocyanate (MITC), including the pesticide’s mode of action. Estimation of health-protective concentrations included assessing clinical study data and available literature, as well as reviewing incident reports from accidental releases involving humans.

Evaluated toxicological data on human exposure to acrylamide and assisted in proposing a hypothesized carcinogenic mode of action. Performed the benchmark dose analysis of toxicological data and analyzed data to ascertain whether acrylamide significantly increased certain cancers in rats.

Investigated the association of ethylene oxide exposure on breast and lymphohematopoietic cancers using mode-of-action analysis, evidence integration, and dose-response evaluation.

Developed Immediately Dangerous to Life or Health (IDLH) documentation for the National Institute for Occupational Safety and Health (NIOSH), including application of duration adjustments for acute exposures.

Supported development of skin notation documents for NIOSH, including utilization of human and animal data on acute and repeat-dose toxicity, skin irritation, and skin sensitization potential.

Statistical Analyses

Analyzed the impact of changes in dietary cholesterol and trans-fatty acid intake on serum lipoprotein concentrations through linear and non-linear Bayesian meta-regression analysis using Markov Chain Monte Carlo (MCMC) methods.

Created packaging recommendations for alcohol-based hand sanitizer to reduce the potential for accidental exposure. Recommendations were based on evaluation of Poison Control Center data, including information on relative abuse rates, to evaluate associations between hand sanitizer packaging and formulation, and the risk of accidental or intentional exposure.

Performed a meta-regression analysis to determine the relative risks associated with occupational exposure to nickel-containing compounds after reviewing available epidemiological data on exposure and reported mortality risks due to specific cancers.

Collaborated with biomathematicians and the USEPA to evaluate mixtures and test for consistency with assumptions of dose addition. This work earned an Honorable Mention for the USEPA's Scientific and Technical Achievement Award (STAA).

Epidemiology

Reviewed epidemiological information regarding occupational exposures to vapors at a nuclear facility. This work required consideration of biases, such as underreporting of effects, confounding exposures, and diagnostic limitations.

Conducted a systematic literature search and review of epidemiological research investigating cleaning products and their ingredients, and asthma or asthma-like syndromes. Developed a set of tools for safety assessment of respiratory responses in occupational cleaning situations based on these findings.

Evaluated historical exposures to sulfidic, oxidic, soluble, and metallic nickel in refining operations. This work involved development of an exposure matrix that adjusts historical exposures to account for changes in refining processes, inaccuracies in speciation, and worker history.

Evaluated associations between glyphosate exposures and multiple cancer endpoints, including but not limited to lymphohematopoietic tumors, as reported in the epidemiological literature. Used meta-analytic approaches to support integration of findings across study populations.

Evaluated the association between ethylene oxide exposure and breast and lymphohematopoietic cancers through critical evaluation of both occupational and community-based epidemiological literature. This information was integrated with mode-of-action analysis to support quantitative dose-response assessment.

Critically reviewed epidemiological literature pertaining to occupational exposures to diacetyl and 2,3-pentanedione for use as a point of departure in human health risk assessments.

Critically reviewed epidemiological literature pertaining to occupational exposures to propylene dichloride to support hazard characterization in human health risk assessments.

Regulatory Support

Assisted in development of nonclinical research strategies, risk assessment frameworks, and bridging strategies to minimize testing requirements in support of submitting a Pre-Market Tobacco Application (PMTA) to the US Food and Drug Administration. Led a team of scientists in evaluating potential health risks from use of electronic nicotine delivery systems (ENDS) to estimate the impact on public health. The risk characterization of exposure included evaluation of flavorings and other chemicals of concern.

Prepared public comments on external review draft human health risk assessments developed by USEPA.

MANUSCRIPTS

Vincent M, Fitch S, Bylsma L, Thompson CM, Rogers S, Britt J, Wikoff D. 2024. Assessment of associations between inhaled formaldehyde and lymphohematopoietic cancer through integration of epidemiological and toxicological evidence with biological plausibility. *Toxicol Sci*, in press, [accepted ms. ahead of publication](#).

Ertuki M, Davis KG, Vincent M, Arnold SF, Maier A. 2024. Micro-environmental factors impact breathing zone exposures: A simulated petrochemical manufacturing facility task. *Arch Environ Occup Health* 31:1–12; doi: 10.1080/19338244.2024.2328523.

Russell AJ, Vincent M, Buerger AN, Dotson S, Lotter J, Maier A. 2024. Establishing short-term occupational exposure limits (STELs) for sensory irritants using predictive and in silico respiratory rate depression (RD50) models. *Inhal Toxicol* 1–13. <https://doi.org/10.1080/08958378.2023.2299867>.

Henderson RG, Vincent M, Rivera BN, Bonn-Miller MO, Doepker C. 2023. Cannabidiol safety considerations: Development of a potential acceptable daily intake value and recommended upper intake limits for dietary supplement use. *Regul Toxicol Pharmacol* Aug25:105482; doi: 10.1016/j.yrtph.2023.105482, [online ahead of print](#).

Stewart CK, Parker J, Hwang R, Vincent M, Fung E. 2023. Quantitative risk assessment of dermal sensitization potential following use of shampoo products containing the formaldehyde releasing preservative DMDM hydantoin. *Int J Toxicol* 42(4):362–333; doi: 10.1177/10915818231174429.

Lynch, HN, Kozal JS, Vincent MJ, Freid RD, Beckett EM, Brown S, Mathis C, Schoeny RS, Maier A. 2023. Systematic review of the human health hazards of propylene dichloride. *Regul Toxicol Pharm* 144:105468; doi: 10.1016/j.yrtph.2023.105468.

Gloekler LE, de Gandiaga EJ, Binczewski NR, Steimel KG, Massarsky A, Kozal J, Vincent M, et al. 2022. Evaluation of the safety and efficacy of hand sanitizer products marketed to children available during the COVID-19 pandemic. *Int J Env Res Pub Health* 19:14424.

Haber LT, Pecquet AM, Vincent MJ, White LM. 2022. The long goodbye: Finally moving on from the relative potency approach to a mixtures approach for polycyclic aromatic hydrocarbons (PAHs). *Int J Env Res Pub Health* 19:9490.

Boles C, Maier A, Vincent M, Stewart C, Attar S, Yeomans D. 2022. Multi-route exposure sampling of quaternary ammonium compounds and ethanol surface disinfectants in a K-8 school. *Indoor Air* 00e13036. doi: 10.1111/ina.13036.

Han A, Buerger AN, Allen H, Vincent M, Thornton SA, Unice KM, Maier A, Quiñones-Rivera. 2022. Assessment of ethanol exposure from hand sanitizer use and potential for developmental toxicity in nursing infants. *J Appl Toxicol* 42(9):1424–1442, doi: 10.1002/jat.4284.

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- Haber LT, Reichard JF, Henning AK, Dawson P, Chinthraja RS, Sindher SB, Long A, **Vincent MJ**, et al. 2021. Bayesian hierarchical evaluation of dose-response for peanut allergy in clinical trial screening. *Food Chem Toxicol* 151:112125, doi:10.1016/j.fct.2021.112125.
- Gadagbui B, Moore J, Parker A, McCready D, Monnot AD, Garnick L, **Vincent M**, et al. 2020. Derivation of cancer no significant risk levels and screening safety assessment for 2-nitropropane in spray products. *J Appl Tox* 40(5):691–705, doi: 10.1002/jat.3937.
- Vincent MJ**, Kozal SJ, Thompson WJ, Maier A, Dotson GS, Best EA, Mundt KA. 2019. Ethylene oxide: Cancer evidence integration and dose-response implications. *Dose Response* 17(4):1559325819888317, PMID:3185323510.
- Vincent MJ**, Allen BA, Palacios OM, Haber LT, Maki KC. 2019. Meta-regression analysis of the effects of dietary cholesterol intake on LDL and HDL cholesterol. *Am J Clin Nutr* 109(1):7–16, doi: 10.1093/ajcn/nqy273.
- Haber LT, Dourson ML, Allen BC, Hertzberg RC, Parker A, **Vincent MJ**, et al. 2018. Benchmark dose (BMD) modeling: Current practice, issues, and challenges. *Crit Rev Toxicol* 48(5):387–415, doi: 10.1080/10408444.2018.1430121.
- Pecquet AM, Martinez JM, **Vincent M**, Erraguntla N, Dourson M. 2018. Derivation of a no-significant-risk-level for tetrabromobisphenol A based on a threshold non-mutagenic cancer mode of action. *J Appl Toxicol* 38(6):862–878, doi: 10.1002/jat.3594.
- Vincent MJ**, Bernstein JA, Basketter D, LaKind JS, Dotson GS, Maier A. 2017. Chemical-induced asthma and the role of clinical, toxicological, exposure and epidemiological research in regulatory and hazard characterization approaches. *Regul Toxicol Pharmacol* 90:126–132, doi: 10.1016/j.yrtph.2017.08.018.
- Vincent MJ**, Parker A, Maier A. 2017. Cleaning and asthma: A systematic review and approach for effective safety assessment. *Regul Toxicol Pharmacol* 90:231–243, doi: 10.1016/j.yrtph.2017.09.013.
- Haber LT, Bates HK, Allen BC, **Vincent MJ**, Oller AR. 2017. Derivation of an oral toxicity reference value for nickel. *Regul Toxicol Pharmacol* 87(S1–S18), doi: 10.1016/j.yrtph.2017.03.011.
- Allen BC, **Vincent MJ**, Liska DA, Haber LT. 2016. Meta-regression analysis of the effect of trans fatty acids on LDL-cholesterol. *Food Chem Toxicol* 98:295–307.
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- Maier A, **Vincent M**, Hack E, Nance P, Ball W. 2014. Derivation of an occupational exposure limit for inorganic borates using a weight of evidence approach. *Regul Toxicol Pharmacol* 68(3):424–437.
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Cain WS, Dourson ML, **Kohrman-Vincent MJ**, Allen BC. 2010. Human chemosensory perception of methyl isothiocyanate: Odor and chemesthesis. *Regul Toxicol Pharmacol* 58(2):173–180.

Dourson M, **Kohrman-Vincent M**, Allen B, Cain W. 2010. Dose response assessment from effects of acute exposure to methyl isothiocyanate (MITC). *Regul Toxicol Pharmacol* 58(2):181–188.

Maier A, **Kohrman-Vincent M**, Parker A, Haber LT. 2010. Evaluation of concentration-response options for diacetyl in support of occupational risk assessment. *Regul Toxicol Pharmacol* 58(2):285–296.

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BOOK CHAPTERS

Gadagbui B, **Vincent M**, Willis A. 2014. Methyl isothiocyanate. In: Wexler, P (ed), *Encyclopedia of Toxicology*, 3rd ed., pp. 310–313. Elsevier.

Zhao QJ, Haber L, **Kohrman-Vincent M**, Nance P, Dourson M. 2010. Quantitative modeling in noncancer risk assessment. In: Krishnan K, Andersen ME (eds), *Quantitative modeling in toxicology*. John Wiley & Sons Ltd.

ABSTRACTS AND PRESENTATIONS

Vincent M. Epidemiology in quantitative dose-response analysis and point of departure derivation. In: *Capturing unknowns: Increasing utility of epidemiologic studies as key evidence in chemical risk assessment*. Presentation at Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Allen B, **Vincent M**, Lipworth L, Panko J, Suh M, Jiang X, Mumma, Proctor D. Lung cancer risk and exposure to hexavalent chromium: Results of extended mortality study of workers with low level exposures and quantitative risk assessment using pooled analysis of three cohorts. Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Franke K, **Vincent M**, Rogers S, Rivera B, Wikoff D. Assessment of non-occupational exposures to cleaning products and the incidence of asthma and respiratory disease. Abstract 3393, Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Thompson CM, Heintz MM, Rogers SI, Fitch SE, Rivera BN, Klaren WD, **Vincent MJ**, Wikoff DS, Haws LC. Evidence identification and appraisal supporting development of an updated toxicity value for HFPO-DA. Abstract 3654, Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Vincent M, Fitch S, Bylsma L, Thompson C, Rogers S, Britt J, Wikoff D. Integration of toxicological and epidemiological information to evaluate biological plausibility and causality of associations between inhaled formaldehyde (FA) and lymphohematopoietic (LHP) cancers. Abstract 5157, Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Wikoff DS, Fitch S, **Vincent M**. The importance of evidence-based methods and critical appraisal of systematic biases in evaluating causation: Case study on formaldehyde and lymphohematopoietic cancers. Presentation at Society for Risk Analysis (SRA) Annual Meeting, Washington, DC. December 2023. Bates C, Russell A, Dotson GS, **Vincent M**, Lotter J, Maier MA. Establishing OELs for sensory irritants with limited data using predictive and in silico models. Poster presentation P126 at the Society of Toxicology (SOT) Annual Meeting & ToxExpo, San Diego, CA. Toxicologist Late-Breaking Supp. 168(1):17. Abstract 5023. March 2022.

Boles C, Stewart C, **Vincent M**, Attar S, Yeomans D, Maier A. An exposure assessment of disinfectants in school classrooms: A case study scenario-based product safety assessment. Poster presentation P636 at the Society of Toxicology (SOT) Annual Meeting & ToxExpo, San Diego, CA. Toxicologist 186(S1):281. Abstract 3945. March 2022.

Buerger A, Bates C, Boles C, **Vincent M**, Dotson S. Ochratoxin A and pesticides in craft beers: A pilot study. Poster presentation P193 at the Society of Toxicology (SOT) Annual Meeting & ToxExpo, San Diego, CA. Toxicologist Late-Breaking Supp. 168(1):63. Abstract 5085. March 2022.

Gloekler L, Bincewski N, De Gandiaga E, Gibbs K, Kozal J, Massarsky A, **Vincent M**, et al. Evaluation of the safety and efficacy of children's hand sanitizers available during the COVID-19 pandemic. Poster presentation P664 at the Society of Toxicology (SOT) Annual Meeting & ToxExpo, San Diego, CA. Toxicologist 186(S1):287. Abstract 3973. March 2022.

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Kozal JS, **Vincent MJ**, Gloekler LE, De Gandiaga EJ, Massarsky A, Zisook RE, Binczewski NR, et al. Risk assessment of organic impurities detected in hand sanitizers marketed to children during the COVID-19 pandemic. Poster presentation P530 at the Society of Toxicology (SOT) Annual Meeting & ToxExpo, San Diego, CA. Toxicologist 186(S1):150. Abstract 3341. March 2022.

Stewart C, Parker JA, Hwang R, **Vincent M**, Fung ES. Quantitative risk assessment of skin sensitization elicitation following use of shampoo products containing formaldehyde-releasing preservative DMDM hydration. Poster presentation P519 at the Society of Toxicology (SOT) Annual Meeting & ToxExpo, San Diego, CA. Toxicologist 186(S1):148. Abstract 3330. March 2022.

O'Neil HC, **Vincent MJ**, Han AA, Brown SE, Hazell AM, Krieder ML, Madl AM. Hazard and risk banding framework for prioritization and bridging of e-liquids for toxicity testing. Poster presented at Society of Toxicology Annual Meeting, virtual event, March 2021.

Kozal JS, **Vincent MJ**, Thompson WJ, Maier A, Dotson GS, Best EA, Mundt KA. Ethylene oxide: Cancer evidence integration and dose-response implications. Poster presented at Society of Toxicology Annual Meeting, Anaheim, California, March 2020.

Best EA, **Vincent MJ**, Thompson WJ, Maier A, Dotson GS, Kozal JS, Mundt KA. The role of study quality in examining the risk of cancer from occupational exposure to ethylene oxide. Poster presented at Society for Risk Analysis Annual Meeting, Arlington, Virginia, December 2019.

Palacios O, **Vincent M**, Allen B, Haber L, Maki K. The effect of dietary cholesterol on high-density lipoprotein cholesterol levels in men and women: a meta-analysis of randomized controlled trials. American Society of Nutrition Meeting, June 2018.

Vincent M, Maier A, Parker A, Gadagbui B. Characterization of chemical-induced asthma risk: hazard and exposure assessment approaches. *The Toxicologist* 150:398, abstract no. 2694, March 2016.

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