Brianna N. Rivera, Ph.D.

SENIOR SCIENTIST I

CONTACT INFORMATION

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PROFESSIONAL PROFILE

Dr. Brianna Rivera is a toxicologist in ToxStrategies' Health Sciences Practice. She earned her Ph.D. in Toxicology from Oregon State University's Department of Environmental and Molecular Toxicology. Dr. Rivera has an interdisciplinary background in exposure science and mechanistic toxicology. Her dissertation research focused on simplifying complex environmental mixtures by integrating toxicity data, using *in vivo, in vitro,* and *in silico* model systems or exposure data (i.e., consumer habits, demographics, environmental factors) to prioritize chemicals of interest. Specifically, she applied these chemical prioritization approaches to identify important combinations of consumer product-related chemicals from personal or household sampling and polycyclic aromatic hydrocarbons identified at a contaminated site. During her academic career, she completed internships in both the regulatory (U.S. EPA Center for Public Health and Environmental Assessment) and private (consulting) sectors.

Dr. Rivera has experience utilizing new approach methodologies to answer complex research questions. This expertise includes synthesizing mechanistic data from *in vitro, in vivo,* and epidemiological studies, for use in hazard assessments, using mechanistic constructs such as key characteristics of carcinogens, adverse outcome pathways (AOPs), or mode of action (MoA). She also has experience with using open source and in-house R packages to pull, synthesize, and visualize high-throughput and mechanistic data for use in hazard assessments. Furthermore, she has been involved in planning and implementing systematic review from the scoping phase to critical appraisal and synthesis for use in a weight-of-evidence framework.

EDUCATION AND DEGREES EARNED

2022 Ph.D., Toxicology, Department of Environmental and Molecular Toxicology
Oregon State University, Corvallis, OR

2016 B.S., Biology (minors in Chemistry and Psychology), *magna cum laude*
University of Pittsburgh, Pittsburgh, PA

PROFESSIONAL ASSOCIATIONS

2016–Present Society of Toxicology

- Risk Assessment Specialty Section
- Women in Toxicology
- Carcinogenesis

2024–Present American Society for Cellular and Computational Toxicology

HONORS AND AWARDS

2022	Hispanic Organization of Toxicologists Travel Award
2021 and 2020	Karen Wetterhahn Award Nominee, Superfund Research Program
2021	Perry J. Gehring Risk Assessment Award
2021	Best Abstract, Society of Toxicology, Mixtures Specialty Section
2021	Eric A. Andreasen Travel Award for Excellence in Research and Scholarship
2020	Extramural Paper of the Month, National Institute of Environmental Health Sciences (see Chang et al., below)
2020	Extra Effort Award, Department of Environmental and Molecular Toxicology, Oregon State University
2019	Inclusivity, Diversity Equitability, and Accessibility (IDEA) Scholarship, Oregon Museum of Science and Industry
2019	Travel Award, Society of Environmental Toxicology and Chemistry (SETAC)
2017	T32 Training Grant Fellowship (2 years), National Institute for Environmental Health Sciences

SELECTED PROFESSIONAL EXPERIENCE

Hazard Assessment

Synthesized human, animal, and mechanistic data for hazard assessment for food and environmental chemicals. Mechanistic data was synthesized using key characteristics of carcinogens and biological plausibility of carcinogenic hazard in humans was informed using mode of action.

Investigated mediators of non-chemical stressors, and their underlying biology, to further understand the interaction of chemical and non-chemical stressors by utilizing adverse outcome pathways. Artificial intelligence

was used to help prioritize literature from a large corpus. Prioritized articles were reviewed, and relevant data was extracted and incorporated to develop a novel proposed AOP.

Utilized an open-source R package (ToxCast pipeline or tcpl) linked to an internal MySQL database to pull medium and high-throughput *in vitro* data from the U.S. Environmental Protection Agency (EPA) Forecaster (ToxCast) program. An existing in-house R script was used to determine a new hit call based on quality of the data, model fit, and cytotoxicity. Specifically, assays related to effects on estrogen, androgen, thyroid, or steroidogenesis were pulled and synthesized to help inform endocrine disruption hazard.

Synthesized data from regulatory assessments of low and no calorie sweeteners to identify potential for cumulative impacts of LNCS mixtures.

Assessed the biological plausibility of potential effects of OTC drug on reproductive and developmental endpoints using an adverse outcome pathway framework.

Supported synthesis and visualization of existing intake values for CBD and derivation of recommended acceptable daily intake value and upper intake limits.

Conducted high-throughput screening of polycyclic aromatic hydrocarbons (PAHs) and consumer product-related chemicals using primary human bronchial epithelium and zebrafish to prioritize chemicals collected from complex environmental exposures.

Collected publicly available toxicity information using federal databases, USEPA CompTox Dashboard, and a QSAR model to prioritize PAHs identified in a complex environmental sample. Various approaches were explored to integrate toxicity information and environmental concentrations to prioritize chemicals of high hazard and exposure potential.

Evaluated different approaches to form chemical mixtures that are representative of complex environmental exposures for toxicity testing and chemical prioritization. The chemical composition and toxicity of each mixture were compared to determine differences in chemical composition and associated biological effects.

Investigated chemical-specific mechanisms, drivers of toxicity, and mixture interactions of a PAH mixture in an organotypic lung cell model through measurement of gene expression using qPCR.

Systematic and Literature Review

Conducted a narrative review to assess the safety and efficacy of low and no calorie sweeteners (LNCS). This involved reviewing regulatory assessments on LNCS and reviewing recent peer-reviewed literature.

Reviewed and summarized existing literature related to climate change and ecosystem services for current approaches in assessing the cumulative impacts of these non-chemical stressors on environmental justice communities. Identified data gaps and future research needs in these topic areas to account for disparities of) these communities and potential mitigation measures required to ensure resilience to a changing climate and its cumulative impacts.

Conducted title/abstract screening, full-text screening, data extraction, and data quality evaluation for chemical safety assessments.

Performed literature searches of primary and regulatory sources to investigate potential emerging chemicals of concern.

Reviewed state regulatory-body databases for regulations regarding consumer product ingredients, and per- and polyfluoroalkyl substances (PFAS) environmental justice initiatives.

Conducted literature searches to support regulatory guidance for risk assessment and general human health risk assessment of mixtures.

Exposure

Using results from high-throughput screening, selected chemicals identified as bioactive were investigated further for real-world exposure relevance by looking at correlations of individual chemical concentrations in personal samplers from an international data set.

Using community-engaged research, passive environmental samplers were used to evaluate nation-wide exposures to consumer product-related chemicals in and outside the home. The influence of household behaviors, demographics, regional location, and environmental factors (i.e., point-source proximity) were integrated to assess their influence on chemical exposure profiles.

Investigated the influence of PAH exposure from a local point source on adverse neonatal health outcomes in horses using time-integrated sampling.

SERVICE AND LEADERSHIP

2022–2023 Society of Toxicology, Mixtures Specialty Section Officer

2022 Society of Toxicology, Session Chair

2021–2022 Society of Toxicology

- Professional Development Subcommittee
- Education and Career Development Committee

2020–2021 Oregon State University

- President of Trainees in Environmental and Molecular Toxicology
- Search Committee for Associate Dean of Academics
- Promotion and Tenure Student Committee

PUBLISHED WORK

Borghoff SJ, Heintz MM, **Rivera BN**, Haws L, Thompson C. 2025. Evaluation of an anti-thyroid mode of action for thyroid follicular cell adenomas in female mice exposed to tertiary butyl alcohol. Regul Toxicol Pharmacol 163(Dec):105936; doi: 10.1016/j.yrtph.2025.105936.

Borghoff SJ, **Rivera B**, Fitch S, Buerger AN, Choksi, N, Franzen A, ... Lea IA. 2025. Systematic evaluation of the evidence base on methyl tert-butyl ether supporting a lack of concern for carcinogenic hazard in humans based on animal cancer studies and mechanistic data. Curr Res Toxicol 8:100224; doi: 10.1016/j.crtox.2025.100224.

Klaren WD, **Rivera BN**, Sheppard AM, Franke K, Wikoff DS. 2025. Approach for systematically assessing study reliability and relevance in evaluations of monosodium glutamate safety. Curr Res Toxicol 9(Sep):100256; doi: 10.1016/j.crtox.2025.100256.

Rivera B, Lea I, Fitch SE, Choksi N, Franzen A, Bus J, … Borghoff S. 2025. Systematic evaluation of the evidence base on ethyl tert-butyl ether and tert-butyl alcohol for carcinogenic potential in humans; Lack of concern based on animal cancer studies and mechanistic data. Preprint available on OSF Preprints: https://doi.org/10.31219/osf.io/bktwd_v1.

Mattes RD, **Rivera BN,** Rutigliani GR, Rogers S, Mendoza ID, Wang L, Beckemeier K, Wikoff D. 2024. A review of low- and no-calorie sweetener safety and weight management efficacy. Nutrition Today 59(6):261-288; doi: 10.1097/NT.0000000000000723.

Borghoff SJ, Cohen SS, Jiang X, Lea IA, Klaren WD, Chappell GA, Britt JK, **Rivera BN**, Choksi NY, Wikoff DS. 2023. Updated systematic assessment of human, animal and mechanistic evidence demonstrates lack of human carcinogenicity with consumption of aspartame. Food Chem Toxicol 172(Feb):113549; doi: 10.1016/j.rfct.2022.113549.

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 144(Oct):105482; doi: 10.1016/j.yrtph.2023.105482.

Rivera BN, Ghetu CC, Chang Y, Truong L, Tanguay RL, Anderson KA, Tilton SC. 2022. Leveraging multiple data streams for prioritization of mixtures for hazard characterization. Toxics 10(11):651; doi: 10.3390/toxics10110651.

Rivera BN, Wilson LB, Kim DN, Pande P, Anderson AK, Tilton SC, Tanguay RL. 2022. A comparative multi-system approach to characterizing bioactivity of commonly occurring chemicals. Int J Environ Res Public Health 19(7):3829; doi: 10.3390/ijerph19073829.

Chang Y, Huynh CTT, Bastin KM, **Rivera BN**, Siddens LK, Tilton SC. 2020. Classifying polycyclic aromatic hydrocarbons by carcinogenic potency using in vitro biosignatures. Toxicol in Vitro 69(Dec):104991; doi: 10.1016/j.tiv.2020.104991.

Mullen KR, **Rivera BN**, Tidwell AG, Ivanek R, Anderson KA, Ainsworth DM. 2020. Environmental surveillance and adverse neonatal health outcomes in foals born near unconventional natural gas development activity. Sci Tot Environ 731(Aug 20):138497; doi: 10.1016/j.scitotenv.2020.138497.

PRESENTATIONS

Borghoff SJ, **Rivera BN**, Fitch S, Buerger A, Choksi N, Franzen A, Bus J, Rushton EK, Lea I. Systematic evaluation of the evidence base on methyl tert-butyl ether for carcinogenic potential in humans; Low concern based on animal cancer studies and mechanistic data. Abstract 4702, Society of Toxicology 64th Annual Meeting, Orlando, FL, March 2025.

Rivera BN, Lea IA, Fitch S, Choksi N, Franzen A, Bus J, Rushton EK, Borghoff SJ. Systematic evaluation of the evidence base on ethyl tert-butyl ether and tert-butyl alcohol for carcinogenic potential in humans: Low concern based on animal cancer studies and mechanistic data. Abstract 4697, Society of Toxicology 64th Annual Meeting, Orlando, FL, March 2025.

Rivera BN, Wikoff D. Consideration of study quality in evidence-based assessments to streamline workflow on rapid and systematic reviews. Platform presentation at Society of Birth Defects Research & Prevention 63rd Annual Meeting, Charleston, NC, June 2023.

Rivera BN, Bramer L, Ghetu CC, Rohlman D, Adams K, Waters K, Anderson KA. The influences of household behavior, environmental, and demographic factors on indoor and outdoor air quality. Poster presented at Society of Toxicology 62nd Annual Meeting, Nashville, TN, March 2023.

Rivera BN, Rogers S, Svetlik S, Klaren WD, Wikoff D, Henderson RG. Scoping review of the immunomodulatory effects of cannabidoil: Effects with T cells. Poster presented at Society of Toxicology 62nd Annual Meeting, Nashville, TN, March 2023.

Rivera BN, Ghetu CC, Anderson K, Tilton S. A novel framework to develop sufficiently similar mixtures. Presented at Society of Toxicology Risk Assessment and Mixtures Joint Specialty Section Webinar, January 2022.

Rivera BN, Rohlman D, Anderson K, Tilton S. Chemical mixtures: What we know and where the field is headed. Presented at Northwest Toxics Community Coalition Virtual Summit, April 2021.

Rivera BN, Ghetu C, Adams K, Anderson K, Tilton S. A novel approach to forming sufficiently similar mixtures from environmental exposure data. Presented at Pacific Northwest Association of Toxicologists Annual Meeting, Virtual, November 2020.

Rivera BN, Ghetu CC, Rohlman D, Adams K, Anderson KA comprehensive comparison of indoor vs outdoor air quality across the United States. Presented at Society of Environmental Toxicology and Chemistry, Virtual Meeting, November 2020.

Rivera BN, Mullen K, Tidwell L, Ivanek R, Ainsworth D, Tilton S, Anderson K. Time-integrated exposures to identify chemical profiles between health and dysphagic foals. Presented at New Frontiers in Dynamic Toxicology, Society of Toxicology 59th Annual Meeting, Virtual, March 2020.

ADDITIONAL TRAINING

Navigating Software and Database Updates to ToxCast: Targeted Bioactivity Data for Toxicology, ASCCT, October 2024

A Training on the OECD Guidance for Characterizing, Validating, and Reporting Physiologically Based Kinetic Models, Society of Toxicology, March 2023

How Advances in Exposure Science and Toxicology Are Changing Assessments of the Effects of Chemical Mixtures on Human Health, Society of Toxicology, March 2022

Insider Secrets for Design and Analysis of Defined Mixture Experiments, Society of Toxicology, March 2021

Rapid Chemical Assessment Using Computational Methods, Society of Toxicology, March 2021

Introduction to Health Risk Assessment of Environmental Chemical Mixtures, Society of Risk Analysis Workshop, December 2020

Writing Your Science for the Public and How to Share It, SETAC CE Course, SciCon2 Virtual Meeting, November 2020

Modern Modeling Strategies to Address Uncertainty and Variability in Dose-Response Assessment, Society of Toxicology CE Virtual Meeting, March 2020