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 holds a Ph.D. in Toxicology from Oregon State University's Department of Environmental and Molecular 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 sector (USEPA Center for Public Health and Environmental Assessment) and the consulting arena.

Dr. Rivera has a diverse, interdisciplinary background in exposure science and safety assessment. She has experience gathering toxicity values and conducting human health risk assessments for environmental sampling, along with a strong foundation in statistical and graphical analysis of large, multidimensional data sets using R and GraphPad. Her skills include using the software packages SWIFT-Review/Active Screener, DistillerSR, HAWC, EJ Screen, and JMP Pro. Working in the field and lab, she has constructed, deployed, and extracted passive samplers; prepared analytical standards; conducted analyses using gas chromatography–mass spectrometry (GC-MS); and studied primary lung cells (2D and 3D) and zebrafish.

EDUCATION AND DEGREES EARNED

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

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

PROFESSIONAL ASSOCIATIONS

2016–Present   Society of Toxicology

- Mixtures Specialty Section

- Risk Assessment Specialty Section

- Exposure Specialty Section

- Hispanic Organization of Toxicologist Special Interest Group

2018–Present   Society of Environmental Toxicology and Chemistry

HONORS AND AWARDS

2022   Hispanic Organization of Toxicologists Travel Award

2021 & 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

Assisted in reviewing mechanistic evidence of an OTC drug for reproductive and developmental effects using an adverse outcome pathway framework.

Reviewed, extracted, and synthesized animal and mechanistic data for hazard assessment of artificial sweeteners.

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. Explored various approaches to integrating 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.

Exposure

Using results from high-throughput screening, selected chemicals identified as being 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, used passive environmental samplers to evaluate nationwide 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.

Systematic and Literature Review

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 among 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.

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

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 144:105482; https://doi.org/10.1016/j.yrtph.2023.105482.

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 172:113549, https://doi.org/10.1016/j.fct.2022.113549.

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; https://doi.org/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; https://doi.org/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 69:104991; https://doi.org/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 732:138497; https://doi.org/10.1016/j.scitotenv.2020.138497

PRESENTATIONS

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.

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.

Rivera BN, Wikoff D. Consideration of study quality in evidence-based assessments to streamline workflow on rapid and systematic reviews. Platform Presentation at 63rd annual Society of Birth Defects Research & Prevention, Charleston, NC, June 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 62nd annual Society of Toxicology, Nashville, TN, March 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 62nd annual Society of Toxicology, Nashville, TN, March 2023.

Rivera BN, Ghetu CC, Anderson K, Tilton S. A novel framework to develop sufficiently similar mixtures. Society of Toxicology webinar, Presented at 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 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, 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, Mullen K, Tidwell L, Ivanek R, Ainsworth D, Tilton S, Anderson K. Time-integrated exposures to identify chemical profiles between health and dysphagic foals. New Frontiers in Dynamic Toxicology, Society of Toxicology Virtual Annual Meeting, March 2020.

ADDITIONAL TRAINING

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