Lauren Brown, M.S., DABT

SENIOR SCIENTIST II

CONTACT INFORMATION

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PROFESSIONAL PROFILE

Ms. Lauren Brown is a board-certified toxicologist in ToxStrategies' Health Sciences Practice. She has more than 12 years of professional experience, including implementing risk assessments, developing toxicological reference values, evaluating toxicological studies, performing systematic literature reviews, carrying out risk characterization and conducting scientific analysis. In her career, Ms. Brown has worked with a diverse client base, including government (federal and state), private sector, and non-governmental organizations. At ToxStrategies, her work revolves around providing clients in the personal-care and cosmetics space with toxicological support related to safety assessment, toxicity testing, and protocol development. Prior to joining ToxStrategies, she managed a large volume of technical consulting work related to human health hazard and risk assessment. This work spanned multiple contracts and federal agencies, including the U.S. EPA and the Agency for Toxic Substances and Disease Registry (ATSDR).

Ms. Brown has provided technical support to clients for all aspects of risk assessment, including hazard characterization, exposure assessment, dose-response analyses, and risk characterization. Her experience includes conducting safety assessment for a variety of cosmetic and personal-care products for small to large companies. In addition, Ms. Brown has supported human health benefits assessments of proposed EPA regulations relating to reduction of chemical exposures under the Toxics Substances Control Act and the Safe Drinking Water Act. She has also supported EPA and non-profit groups in understanding the magnitude of adverse health effects related to lead and perchlorate exposure. She has also implemented literature reviews, incorporating systematic review methods such as risk-of-bias assessments and weight-of-evidence hazard characterization. She is adept with tools used for systematic reviews, including DistillerSR, the Health Assessment Workspace Collaborative (HAWC), and AbstrackR.

Ms. Brown earned her Master of Science in Environmental Health from the T.H. Chan School of Public Health at Harvard in 2010. She has presented at multiple scientific conferences, including the Society for Risk Analysis, the Society of Toxicology, and the Toxicology and Risk Assessment Conference, and she was named a Diplomate of the American Board of Toxicology in 2019. She has also been an invited reviewer for the journals *Regulatory Toxicology and Pharmacology* and *Toxicology Reports* and *Environmental Research* and is an active member of the Society of Toxicology.

EDUCATION AND DEGREES EARNED

2019 Diplomate of the American Board of Toxicology

2010 M.S. in Environmental Health, Harvard T.H. Chan School of Public Health

2005 B.A. in Zoology and Environmental Science, Miami University, Ohio (*cum laude*, Phi Beta Kappa)

SELECTED CONTINUING EDUCATION COURSES

2022 Safety Assessment of Cosmetics in the EU. Online. Hosted by Vrije Universiteit Brussel. Moderator: Dr. Vera Rogiers

2022 Animal-Free Safety Assessment of Consumer Products and Ingredients: A Primer. San Diego, CA. Society of Toxicology. Hosted by *In vitro* and Alternative Methods Specialty Section of the Society of Toxicology

2022 Principles and Applications of Read-Across in Human Health Risk Assessment. San Diego, CA. Society of Toxicology. Hosted by the Regulatory and Safety Evaluation Specialty Section

2019 Mid-America Toxicology Course. Kansas City, MO. Moderator: Dr. Curtis Klassen

PROFESSIONAL MEMBERSHIPS

2020–present Society of Toxicology
Michigan Regional Chapter, Member
Sustainable Chemistry for Contemporary Toxicology Specialty Section, Member
Risk Assessment Specialty Section, Member

2019–present Association for the Advancement of Alternatives Assessment

2019–present American Board of Toxicology

SELECTED PROFESSIONAL EXPERIENCE

Personal Care Products and Cosmetics

Provided support for cosmetics brand by providing screening level and comprehensive safety assessments for a variety of cosmetics ingredients, including polymers, botanicals, steroids, and other synthetic chemicals. Assessments have been done for ingredients in both leave-on and rinse-off products.

Developing a protocol for the US FDA to conduct cosmetic safety assessments. The protocol provides a step-by-step process outlining data sources, mathematical approaches, and risk characterization strategies for site of contact, sensitization, phototoxicity, and systemic endpoints. The protocol includes details on considerations which are needed for potentially sensitive populations, nanomaterials, and botanical ingredient assessment. The protocol was developed using the best available science, including guidance from SCCS, IFRA, CIR, RIFM, ASEAN, and FDA, and subject-matter experts in the field.

Providing support to a large cosmetics brand in developing SOPs for situations when it is appropriate to bridge data from already-conducted tests. The work involves reviewing company internal procedures, interviewing

knowledgeable staff on current processes, and providing a recommended framework to improve testing approaches.

Toxicology and Risk Assessment

Directed a project to oversee the development of toxicological profiles for 13 different chemicals for ATSDR. Managed a team of 10 scientists to assess chemical hazard, develop minimum risk levels (MRL), and summarize the information in comprehensive reports for public consumption. Implemented all aspects of systematic reviews for several chemicals, including scoping, literature screening, study quality evaluations, and weight-of-evidence hazard characterization. To develop MRLs, used multiple methods that included dose-response modeling (using EPA's Benchmark Dose Software) and the more traditional NOAEL/LOAEL approach with uncertainty factors, depending on data availability.

Collaborated with scientists at ATSDR to develop a method to standardize public health assessments at contaminated sites. Worked with ATSDR toxicologists in developing a process to distill data presented in toxicological profiles for efficient interpretation. Using established risk values, along with the data used to derive them, categorized ranges of exposure into no risk, approaching risk, likely risk, and definitive risk. Also proposed values associated with these ranges for several contaminants, including benzene, trichloroethylene, and chromium VI.

Managed a project to develop and implement a novel approach to setting a maximum contaminant level for perchlorate in drinking water. Reviewed the epidemiologic literature, evaluated study quality, and developed dose-response functions to evaluate adverse health outcomes associated with alterations in thyroid hormone levels, along with characterizing the uncertainties in the analysis and developing a report for peer review. Ultimately, several toxicological reference values were derived for the Agency to consider in the context of their regulatory determination process.

Managed the technical analysis for EPA's assessment of a household action level for lead in drinking water. Developed lead exposure profiles, quantified shifts in distributions of blood lead levels for given changes in water lead levels, and described the connection between blood lead levels and adverse health outcomes. Using these multiple approaches, derived toxicological reference values for the Agency to consider in the context of their regulatory rule-making process.

Served as project director for a team of scientists researching data gaps related to PFAS exposure and immune outcomes. Conducted literature reviews, including epidemiological and toxicological literature. Identified data gaps and cross-walked them to the data collected in the National Health and Nutrition Survey (NHANES) to determine whether any gaps could be filled with novel statistical analysis of that data set.

Supported the National Academy of Science's Airport Cooperative Research Program in implementing a study on the lessons learned from the COVID-19 pandemic in airports. Developed interview scripts to collect needed data. In addition, interviewed more than 50 airports' local public health officials and CDC quarantine officers about their experiences in implementing protocols to mitigate the spread of COVID-19, and lessons learned.

Supported the Occupational Safety and Health Administration to understand gaps in guidance for COVID-19. This work involved surveying available guidance in the education sector and identifying sectors in need of additional guidance. Research indicated that employees of libraries needed additional direction. Subsequently, interviewed library associations and staff to determine the most useful materials to support re-opening facilities safely. Developed a checklist for use by library management and staff in mitigating the spread of COVID-19.

Using alternatives assessment–based methods—including from EPA's Design for the Environment program, GreenScreen®, and Washington State's Quick Chemical Assessment Tool—developed and implemented a novel approach to efficiently rank more than 40 chemical solvents that are listed on the Toxics Release Inventory. Presented work at multiple conferences.

Developed a dose-response relationship between adult lead exposure and risk of cardiovascular disease mortality using a rigorous weight-of-evidence evaluation of existing epidemiological literature. Created a report that was peer reviewed and well received by experts in lead and risk assessment. Published work in *Environmental Health Perspectives*.

Developed supporting documentation for the US EPA to identify an indicator of exposure to PFAS for inclusion in their *Report* on *the Environment*. Provided recommendations on the most appropriate PFAS to include and data on general US population exposure.

Managed research related to mosquito control activities in Massachusetts. Developed a comprehensive report for a governor-appointed task force that touched on a multitude of topics related to mosquito control, including the history of arbovirus in Massachusetts, the toxicity of pesticides, the quantitative benefits of mosquito control programs, and best practices for mosquito control.

Oversaw the development of EPA's Alternatives Assessment for decabromodiphenyl ether (DecaBDE). Compiled a >800-page report and developed chapters on chemical uses, production, and exposure potential.

Technical lead for the analysis of Washington State's *Guide to Chemical Alternatives Assessment*. Used the guide to test the alternatives assessment techniques for selecting a safer alternative to copper boat paints.

Developed a framework to evaluate the impact of aflatoxin exposure from agricultural products on human health. This framework was ultimately used to identify national priorities for preventing, controlling, and mitigating harmful effects of aflatoxin. This 2017 project received a corporate award for outstanding social impact and provided the impetus for the country of Tanzania to establish a National Steering Committee for Mycotoxins Control.

Represented the District of Columbia in several emergency response situations related to environmental contamination, including oil spills and train derailments.

PEER-REVIEWER

Regulatory Toxicology and Pharmacology

Toxicology Reports

Environmental Research

PEER-REVIEWED PUBLICATIONS

Brown L., Lynch M, Belova A, Klein R, Chiger A. 2020. Developing a health impact model for adult lead exposure and cardiovascular disease mortality. Environ Health Persp 128:9, https://doi.org/10.1289/EHP6552.

Keith S, Alman B, **Brown L**, Beins K, Derrick H, Diskin K, Chiger A, Juergens M, Lynch M (Chemical Manager Team). 2022. Toxicological profile for chloromethane (Draft for public comment). Agency for Toxic Substances and Disease Registry, https://www.atsdr.cdc.gov/ToxProfiles/tp106.pdf.

POSTERS AND PRESENTATIONS

Brown L, McMillan DA, Urban JD, Mihalchik AL. A tiered approach for assessing the safety of polymeric ingredients in cosmetics and personal care products. Poster presented at Society of Toxicology Annual Meeting, Nashville, TN, March 2023.

Whitaker M, **Brown L**. Safer chemical tools and practices: Successes in advancing safer chemical selection on a global scale. Abstract Accepted for Society of Toxicology, 2022.

Brown L, Klein R. Understanding the relationship between maternal thyroid hormones and neurodevelopmental outcomes. Poster presented at International Society for Environmental Epidemiology (virtual), 2021.

Brown L, Forth H, Reichle L, Casner AJ, McFadden A. Using alternatives assessment approaches to inform the ranking of TRI-listed solvent chemicals. Poster presented at Society for Risk Analysis, Arlington, VA, 2019.

Branch F, Pfahles-Hutchens A, **Brown L,** Chiger A, Rajan P, Hubbard H, Melia J, Riley K. Data quality evaluation for epidemiologic studies under amended TSCA. Poster presented at the International Society for Environmental Epidemiology/International Society for Environmental Exposure, Ottawa, CA, 2018.

Lynch M, **Brown L,** Chiger A. Case studies for neurotoxic chemicals. Presentation to Society for Risk Analysis, San Diego, CA, 2017.

Brown L, Pepping T, He K. Understanding the relationship between alterations in thyroid hormone levels and subsequent neurodevelopmental impacts. Poster presented at Society of Toxicology, New Orleans, LA, 2016.

Brown L, Connor E. Managing chemical risk through alternatives assessments: Case studies and current initiatives. Presentation to Society for Risk Analysis, Denver, CO, 2014.

Brown L, Lynch M, Post E, Belova A. Determine a concentration response relationship suitable for estimating adult benefits of reduced lead exposure. Presentation to Society for Risk Analysis, Baltimore, MD, 2013.

Belova A, Narayan T, **Brown L,** Haskell J, Bozeman S, Lamb J. A framework to assess aflatoxin public health impacts in developing countries with application to Nigeria and Tanzania. Presentation to Society for Risk Analysis, Baltimore, MD, 2013.

Lynch M, **Brown L,** Chun A, Reid J, Russel P. Risk communication for the Toxic Release Inventory. Poster presentation to Society for Risk Analysis, 2012.