

Lauren Brown, M.S., DABT

ASSOCIATE DIRECTOR
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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, sustainable toxicology, alternatives 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 US 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 assessments for a variety of compounds used in consumer products. 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 also performed a comparative hazard assessment on all toxic release inventory listed solvents, including ethylbenzene, evaluating data across nine endpoints. Additionally, she has implemented literature reviews, incorporating systematic review methods such as risk-of-bias assessments and weight-of-evidence hazard characterization.

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*. In addition, she a full member of the Society of Toxicology and in 2024, is the incoming President of the Sustainable Chemicals through Contemporary Toxicology specialty section.

EDUCATION AND DEGREES EARNED

- 2019 Diplomate of the American Board of Toxicology (Recertification 2024)
- 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
Sustainable Chemistry for Contemporary Toxicology Specialty Section, Incoming President (2024-2025)
Risk Assessment Specialty Section, Member
- 2019–present Association for the Advancement of Alternatives Assessment, Executive Council Member (2022–present)
- 2019–present American Board of Toxicology

SELECTED PROFESSIONAL EXPERIENCE

Personal Care Products and Cosmetics

Oversees ToxStrategies’ work in the personal care and cosmetics space. Regularly provides support for cosmetics brands 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. Provides guidance to clients on approaching safety assessment for novel ingredients using non-animal methods.

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

Provide 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 the US 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.

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 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.

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.

Chemical Hazard and Alternatives Assessment

More than a decade of experience conducting chemical hazard and alternatives assessments. Led ToxStrategies' efforts to become ChemForward verified; currently serves as the project manager for ToxStrategies' work with ChemForward.

Using alternatives assessment-based methods—including from the 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 by hazard that are listed on the Toxics Release Inventory. Presented work at multiple conferences.

Regularly accesses the EPA Chemical Hazard Comparison dashboard and 3E Exchange to support client requests, to prioritize hazards assessments for endpoints of most interest for a given compound, and to assist in internal quality assurance of hazard assessment work products. Trains staff internally on use of these tools.

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.

Participated in case studies for identifying alternatives to copper anti-fouling boat paint to test the original Interstate Chemical Clearinghouse (IC2) Alternatives Assessment Guide (a project funded by Washington state).

PEER - REVIEWER

Regulatory Toxicology and Pharmacology

Toxicology Reports

Environmental Research

PEER - REVIEWED PUBLICATIONS

Rudisill C, Jacobs M, Roy M, **Brown L**, Eaton R, Malloy T, Davies H, Tickner JT. 2023. The use of alternatives assessment in chemicals management policies: Needs for greater impact. *Integr Environ Assess Manag*. doi: 10.1002/ieam.4826. Epub ahead of print. PMID: 37658263.

Buser M, Roney N, Antezana A, Derrick H, Chiger A, **Brown L**, Beins K. (Chemical Manager Team). 2022. Toxicological profile for disulfoton. (Draft for public comment). Agency for Toxic Substances and Disease Registry. <https://www.atsdr.cdc.gov/ToxProfiles/tp65-p.pdf>

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>.

Pohl H, Buser M, ... **Brown L**, et al. (Chemical Manager Team). 2022. Toxicological profile for glyphosate. Final Draft. Agency for Toxic Substances and Disease Registry. <https://www.atsdr.cdc.gov/ToxProfiles/tp214.pdf>

Williams M, Przybyla J, Keith S, **Brown L**, et al. (Chemical Manager Team). 2022. Toxicological profile for nitrobenzene (Draft for public comment). Agency for Toxic Substances and Disease Registry, <https://www.atsdr.cdc.gov/ToxProfiles/tp140-p.pdf>

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>.

POSTERS AND PRESENTATIONS

Brown L. Safety substantiation of complex cosmetic ingredients – Considerations and approaches to comply with MoCRA. Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Brown L, Katz L, Sullivan K, Cuevas A. Evaluating and confirming safety in the context of the modernization of Cosmetics Regulation Act. ToxForum Summer Meeting, Arlington, VA, 2023.

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. Co-Chair. Society of Toxicology Annual Meeting, San Diego, CA, 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.