Exponent®
Engineering & Scientific Consulting

Michael Lumpkin, Ph.D., DABT

Senior Managing Scientist | Health Sciences
Denver
+1-303-802-3370 | mlumpkin@exponent.com

Professional Profile

Dr. Lumpkin is a board-certified toxicologist specializing in chemical exposure, exposure reconstruction, and risk assessment and communication. For more than 22 years, he has performed expert analysis for the chemical, pharmaceutical, and petroleum industries, U.S. Environmental Protection Agency (EPA), U.S. Agency for Toxic Substances and Disease Registry (ATSDR), U.S. Department of Defense (DoD), trade associations, and state, federal, and local emergency response agencies.

Dr. Lumpkin provides toxicological analyses on numerous classes of compounds, including PFAS, petrochemicals, PAHs, perchlorates, pesticides, metals, solvents, and inhaled dust. He developed, critiqued and applied Physiologically Based Pharmacokinetic (PBPK) models for lead, volatile organic compounds (VOCs), pesticides and bioterrorism agents. He has coauthored numerous peer-reviewed hazard and risk assessments for the EPA and ATSDR.

Dr. Lumpkin designs and performs occupational and residential exposure reconstruction studies for various compounds using laboratory and field simulations. He developed novel occupational exposure limits for pharmaceutical and industrial chemicals. He has provided expert risk communication to community groups living close to petroleum facilities, carbon capture sequestration (CCS) sites, nuclear facility workers, and emergency responders.

Academic Credentials & Professional Honors

Ph.D., Toxicology, University of Georgia, 2002

B.S., Biochemistry, University of Georgia, 1994

Licenses and Certifications

Diplomate of the American Board of Toxicology (DABT)

Professional Affiliations

Member, Society of Toxicology, 2003-Present

Councilor, Risk Assessment Specialty Section of the Society of Toxicology, 2014-2016

President, Southeastern Regional Chapter of the Society of Toxicology, 2011-2013

Publications

Perez, A, Lumpkin M, Kornberg, T, Schmidt, A. 2023. Critical endpoints of PFOA and PFOS exposure for regulatory risk assessment in drinking water: Parameter choices impacting estimates of safe exposure levels. Regul Tox Pharm. 138: 105323.

Campbell, J, Franzen A, Van Landingham C, Lumpkin M, Crowell S, Meredith C, Loccisano A, Gentry R, Clewell C. 2016. Predicting lung dosimetry of inhaled particle borne benzo[a] pyrene using physiologically based pharmacokinetic modeling. Inhal Toxicol. 28: 520-535.

Rodricks J and Lumpkin M. 2013. DMAA as a Dietary Ingredient. JAMA Intern Med. 173:594-595.

Rodricks J, Lumpkin M, Schilling B. 2013. Pharmacokinetic data distinguish abusive versus dietary supplement uses of 1,3-dimethylamylamine. Ann Emerg Med. 61:718-719.

Faroon O, Roney N, Taylor J, Ashizawa A, Lumpkin MH, Plewak, DJ. 2008. Acrolein environmental levels and potential for human exposure. Toxicol Ind Health. 24:543- 564.

Faroon O, Roney N, Taylor J, Ashizawa A, Lumpkin MH, Plewak, DJ. 2008. Acrolein health effects. Toxicol Ind Health. 24:447-490.

Fisher J, Lumpkin M, Boyd J, Mahle D, Bruckner J, El-Masri H. 2003. PBPK Modeling on the Metabolic Interactions of Carbon Tetrachloride and Tetrachloroethylene. Environ Toxicol Pharmacol 16:93-105.

Lumpkin MH, Bruckner JV, Campbell JL, Dallas CE, White CA, Fisher JW. 2003. Plasma Binding of Trichloroacetic Acid in Mice, Rats, and Humans under Cancer Bioassay and Environmental Conditions. Drug Metab Disp 31(10):1203- 1207.

Yu KO, Naarayanan L, Mattie DR, Godfrey RJ, Todd PN, Sterner TR, Mahle DA, Lumpkin MH, Fisher JW. 2001. The Pharmacokinetic of Perchlorate and its Effect on the Hypothalamus/Pituitary-Thyroid Axis. Toxicol Appl Pharmacol 181(2):148-159.

Lumpkin M, Plewak D. 2009. Toxicological Profile for 1,3-Butadiene (Update, Draft for Peer Reviewer Comment). Prepared for the Agency for Toxic Substances and Disease Registry.

Bosch S, Lumpkin M, Plewak D. 2009. Toxicological Review of Tert Amyl Methyl Ether (TAME, CAS No. 994-05-8) in Support of Summary Information on the Integrated Risk Information System (IRIS). (Internal EPA review). Prepared for the IRIS Program, National Center for Environmental Assessment, U.S. EPA, Washington, DC.

Lumpkin M, Odin M. 2009. Draft provisional toxicity values for 4,6-Dinitro-o-cresol (CASRN 534-52-1). Prepared for the Superfund Technology Support Center, National Center for Environmental Assessment, U.S. EPA, Cincinnati, OH.

Lumpkin M, Odin M. 2009. Draft provisional toxicity values for methyl acetate (CASRN 72-20-9). Prepared for the Superfund Technology Support Center, National Center for Environmental Assessment, U.S. EPA, Cincinnati, OH.

Lumpkin M, Odin M. 2009. Draft provisional toxicity values for 2-methoxyethanol (CASRN 109- 86-4) and 2-methoxyethanol acetate (CASRN 110-49-6and 32718-56-2). Prepared for the Superfund Technology Support Center, National Center for Environmental Assessment, U.S. EPA, Cincinnati, OH.

McClure P, Llados F, Osier M, Plewak D, Lumpkin M, Ellis B. 2008. Toxicological Review of Dichloromethane (Methylene Chloride) (CAS No. 79-09-2) in Support of Summary Information on the Integrated Risk Information System (IRIS). (Internal EPA review). Prepared for the IRIS Program, National Center for Environmental Assessment, U.S. EPA, Washington, DC.

Lumpkin M, Odin M, Carlson-Lynch H. 2008. Draft provisional toxicity values for 2-methoxyethanol (CASRN 109-86-4). Prepared for the Superfund Technology Support Center, National Center for Environmental Assessment, U.S. EPA, Cincinnati, OH.

Lumpkin M, Odin M. 2008. Draft provisional toxicity values for Diethylene Glycol Monoethyl Ether (CASRN 111- 90-0). Prepared for the Superfund Technology Support Center, National Center for Environmental Assessment, U.S. EPA, Cincinnati, OH.

Lumpkin M, Chappell L, McClure P. 2007. Toxicological Profile for Boron (Update, Draft for Public Comment). Prepared for the Agency for Toxic Substances and Disease Registry.

Lumpkin M, Swarts S, Plewak D. 2007. Toxicological Profile for Acrolein (Update, Final). Prepared for the Agency for Toxic Substances and Disease Registry.

Lumpkin M, Odin M, Carlson-Lynch H. 2007. Draft provisional toxicity values for hydroquinone (CASRN 123- 31-9). Prepared for the Superfund Technology Support Center, National Center for Environmental Assessment, U.S. EPA, Cincinnati, OH.

Lumpkin M, Odin M, Klotzbach J. 2007. Draft provisional toxicity values for p-chloroaniline (CASRN 106-47-8). Prepared for the Superfund Technology Support Center, National Center for Environmental Assessment, U.S. EPA, Cincinnati, OH.

Stickney J, Llados F, Lumpkin M, Odin M. 2007. Toxicological review of 1,4-dioxane (CASRN 123-91-1) in Support of Summary Information on the Integrated Risk Information System (IRIS). Prepared for the IRIS Program, National Center for Environmental Assessment, U.S. EPA, Washington, DC.

Stickney J, Citra M, Lumpkin M. 2006. Toxicological profile for vinyl chloride (Update, Final). Prepared for the Agency for Toxic Substances and Disease Registry.

Stickney J, Llados F, Lumpkin M, Odin M. 2006. Toxicological Review of 1,4-Dioxane (CAS No. 123-91-1) in Support of Summary Information on the Integrated Risk Information System (IRIS). Prepared for the IRIS Program, National Center for Environmental Assessment, U.S. EPA, Washington, DC.

McClure P, Llados F, Osier M, Plewak D, Lumpkin M, Ellis. 2006. Toxicological review of dichloromethane (methylene chloride) (CASRN 79-09-2) in Support of Summary Information on the Integrated Risk Information System (IRIS). Prepared for the IRIS Program, National Center for Environmental Assessment, U.S. EPA, Washington, DC.

Osier M Llados F Plewak D Lumpkin M Odin M (2006) Toxicological review of cerium (stable, CASRN 7440-45-1) and compounds in Support of Summary Information on the Integrated Risk Information System (IRIS). Prepared for the IRIS Program, National Center for Environmental Assessment, U.S. EPA, Washington, DC.

McDougal A, Wohlers D, Lumpkin M, McClure P. 2006. Toxicological Review of Mirex (CAS No. 2385-85-5) in Support of Summary Information on the Integrated Risk Information System (IRIS). Prepared for the IRIS Program, National Center for Environmental Assessment, U.S. EPA, Washington, DC.

Fransen M, Lumpkin M, Rhodes J, McClure P. 2006. Toxicological Review of Acrylonitrile (CAS No. 107-13-1) in Support of Summary Information on the Integrated Risk Information System (IRIS). (Internal EPA review). Prepared for the IRIS Program, National Center for Environmental Assessment, U.S. EPA, Washington, D.C.

Llados F, Garber K, Paikoff S, Lumpkin M. 2006. Toxicological profile for Phenol (Update, Final). Prepared for the Agency for Toxic Substances and Disease Registry.

Lumpkin M, Odin M. 2006. Draft provisional toxicity values for Bifenox (CASRN 42576-02-3). Prepared for the Superfund Technology Support Center, National Center for Environmental Assessment, U.S. EPA, Cincinnati, OH.

Presentations

Lumpkin M. 2025. Pandemic Risk Communication: A Case Study Involving Three Labor Sectors in Three Separate Phases of the COVID-19 Pandemic. Continuing education course section taught at the 63rd Meeting of the Society of Toxicology in Orlando, FL.

Lumpkin M. 2024. Communicating Risk to Varied Stakeholders: Principles and Examples of Inserting Good Science into Conversations of Competing Biases. Presented at the 62nd Meeting of the Society of Toxicology in Salt Lake City, UT.

Bamber A, Costa A, Kloss R, Heitmann A, Yuchs S, and Lumpkin M. 2024. Comprehensive Screening Level Health Risk Assessment in Commerce City, CO: A Two-Year Continuing Study To Evaluate Long-Term Airborne VOC Exposures and Health Risks. Presented at the 62nd Meeting of the Society of Toxicology in Salt Lake City, UT.

Drechsel D, Lumpkin M, McMullin T. 2023. Metal Exposure Associated with Use of Soil and Fertilizer Products in a Commercial Greenhouse Setting with Comparison to Proposition 65 Safe Harbor Levels. Presented at the 62nd Meeting of the Society of Toxicology in Nashville, TN.

Drechsel D, Simoneau T, Lumpkin M. 2023. Formaldehyde Off-Gassing from Bed Sheets and Pillowcases: A Simulation Study. Presented at the 62nd Meeting of the Society of Toxicology in Nashville, TN.

Jacob R, Dahncke K, Lumpkin M. 2023. Lessons Learned from Satartia, MS Incident. Learning from Incidents - Emergency Response Preparedness and Communications. Presented at the 2023 API Pipeline Information eXchange in Houston, TX.

Bamber A, Lumpkin M, McMullin T. 2022. A Novel Approach to Characterize Exposures and Health Risks to Communities Surrounding Oil and Gas Operations in Colorado: Utilizing Real-Time Handheld Air Quality Monitoring and Analytical Air Sampling Methods. Presented at the 61st Meeting of the Society of Toxicology in San Diego, CA.

Lumpkin M, Bamber A, McMullin T. 2022. Use of Benzene Measurements to Evaluate the Role of Setback Distances to Protect Public Health from Oil and Gas Wellpad Emissions in Colorado. 2022. Presented at the 61st Meeting of the Society of Toxicology in San Diego, CA.

Sams R, Shea S, Lumpkin M, Kind J, Britt, A. 2019. Progress in Addressing Workers' Concern Related to Chemical Vapors at the Hanford Site - 19054a. Site presentation at WM2019 Conference in Phoenix, Arizona.

Lumpkin M. 2014. Inhalation Toxicology for First Responders. Training seminar provided to firefighters, national guardsmen, and emergency medical technicians at multiple fire departments across North Dakota.

Lumpkin M, Crowell S, Franzen A, Gentry R, Kaden D, Meredith C, Potts, R. 2014. Development of a PBPK Model for Inhaled Benzo[a]pyrene in Rats and Humans. The Toxicologist 138:1. Presented at the 53rd Meeting of the Society of Toxicology in Phoenix, AZ.

Project Experience

Litigation Support

Provided expert deposition testimony for cases involving occupational or bystander exposures to ammonia, benzene, chlorine gas, chloroprene, pesticides, methacrylates, petroleum, and methylene chloride gas, ethanol/drug pharmacokinetics, carbon dioxide and risk- based environmental health litigation. Cases have included EPA Clean Air Act, toxic tort, and workers compensation claim suits.

Served as a 3rd-party expert in validating PBPK model-based dose response assessment in Clean Air Act litigation related to chloroprene exposure to the public.

Provided risk-based analysis, expert reports, and expert deposition testimony regarding health impacts related to offsite groundwater VOC migration from a municipal landfill and residential pesticide exposures.

Contributed to health impact assessment and expert report development in cases involving public exposures to bisphenol A, coal ash wastes, asbestos, 1,3-butadiene, diisocyanates, mixed VOCs and World Trade Center dust.

Pharmacokinetic Modeling and Analysis

Used occupational and environmental lead data and established PBPK models for lead in adults and children to estimate and communicate health risks for school children, telecommunications workers, and residents living in close proximity to lead-containing infrastructure.

Developed a rodent and human model for inhalation of benzo[a]pyrene for use in regulatory dosimetry and risk assessment.

Developed prototype inhalation models for bioterrorism agents (anthrax and tularemia) in nonhuman primates capable of predicting internal doses deposited in the lungs and distributed through the lymphatic and circulatory systems.

Developed rodent models for drinking water disinfection byproducts during pregnancy, and halogenated hydrocarbons for use in human health risk assessment.

Developed preliminary PBPK models for inhaled polycyclic aromatic hydrocarbons (PAHs).

Reviewed, critiqued and applied PBPK models for a variety of organic compounds including application of PBPK and benchmark dose models for acrylonitrile, dichloromethane and 1,4-dioxane in support of cancer and non-cancer dose-response chapters of EPA IRIS toxicological reviews.

Dose Reconstruction

Designed and performed a simulation of a carbon dioxide pipeline release onto enclosed residential structures to understand the time course of indoor changes in carbon dioxide and oxygen levels and implications for sheltering in place versus evacuating following a pipeline release.

Designed and performed an in-the-field dose reconstruction for silica exposure from a concrete consumer product.

Designed and performed an in-the-field dose reconstruction for methylene chloride exposure to consumers using a paint stripper.

Designed and managed a laboratory dose reconstruction assessment of inhalation and dermal exposure to diisocyanates and other VOCs under simulated occupational conditions.

Performed asbestos dose reconstruction studies representing occupational use and exposures to asbestos containing materials (ACM).

Chemical Toxicity Value Derivation

Provided updated dose-response assessments to clients based on newly available data for metals, VOCs and aldehydes.

Developed evidence-based assessment of a perchlorate drinking water standard and research priorities, presenting finding to an EPA SAB, at national scientific meetings, and to a major trade association.

Provided critical comments pertaining to interpretation of toxicokinetic mode of action and dose-response data for carcinogen toxicity assessments such as formaldehyde and PAHs.

Co-authored toxicokinetics and dose-response chapters, including dose-response modeling of toxicity data to derive reference doses and concentrations, and cancer potency factors, for numerous EPA IRIS toxicological reviews and peer-reviewed provisional toxicity value documents for solvents, metals and aldehydes.

Authored toxicity chapters and derived non-cancer minimal risk levels (MRLs) for numerous ATSDR toxicological profiles for VOCs, metals and pesticides.

Chemical Product Stewardship

Updated an international guidance document on classifying hazards of petroleum products in compliance with GHS standards.

Provided toxicological support to a polystyrene manufacturer’s investigation of customer-reported occupational dermatitis incidents.

Developed a novel occupational exposure limit for a reaction product formed during manufacture of flexible medical tubing. Developed novel occupational exposure limits for cancer chemotherapy, anti-hypertensive, and testosterone-based drug products.

Developed a novel occupational exposure limit for a manufacturing by-product compound using “read across” methodology.

Performed California Proposition 65 Safe Harbor analyses for a variety of consumer products.

COVID-19 Pandemic Risk Mitigation

Served as the lead on-set COVID-19 subject matter expert at Netflix’s Ozark: Season 4 to oversee infection risk mitigation strategies, oversee daily PCR testing program for over 400 workers, and provide cast and crew with state-of-the-science COVID-19 risk education.

Traveled to more than a dozen paper product manufacturing sites experiencing COVID-19 outbreaks to identify infection risk gaps and to educate workers on COVID-19 state-of-the -science for testing and disease transmission.

Provided COVID-19 PCR testing strategy, infection transmission risk reduction, and environmental diagnostic testing consulting to petrochemical corporate EHS and pandemic incident commanders in the U.S. Gulf of Mexico, Europe, and Asia.

Pharmaceutical Product Development

Provided interpretation of human pharmacokinetic data in support of an FDA new drug application. Authored safety assessments of surgical implant devices in support of FDA approval for conduct of human trials.

Dietary Supplement Safety Assessment

Developed a framework for client to use in study design and data interpretation for developing product-specific safety assessments.

Performed safety assessments for multiple dietary supplement products.

Helped client interpret pharmacokinetic data and design human clinical trials for assessing safety of high-cocao flavanol content supplements.

Designed and monitored preclinical rodent toxicity studies for dietary supplement product ingredients. Advised dietary supplement client on technical responses to alleged injury outbreak, including management of technical meetings with FDA and CDC investigators, and technical briefing of U.S. congressional staff.

Incident Response

Led a team of scientists on a multi-year project providing toxicological and risk communication support to address chemical vapor exposures to workers at the U.S. Department of Energy Hanford nuclear site.

Designed and implemented air monitoring studies of oil and gas well pads in Colorado to assess public health risks and support science-based regulatory decision making and community risk communication.

Served as lead toxicologist for teams responding to dozens of gasoline and crude oil pipeline releases, chemical warehouse fires, mercury spills, train derailments, and a petroleum refinery tank failure, including interaction with client environmental health professionals and members of the unified command. Provided real-time risk interpretation and derived screening levels for numerous solvents, pesticides, asbestos, metals, combustion byproducts, fire smoke and particulate matter.

Developed and taught a seminar on inhalation toxicity for firefighters, EMTs, refinery workers, and National Guardsmen.

Assessed likely health impacts of perchlorate, lead, and copper exposures following accidental releases into municipal drinking water systems and school water supplies.