PROFESSIONAL PROFILE

CONTACT INFORMATION

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200 Summit Drive, Suite 500
Burlington, MA 01803

EDUCATION

PhD, Toxicology, University of Colorado Anschutz Medical Campus, 2010
BS, Biology and Vertebrate Physiology, Pennsylvania State University, 2003
Diplomate of the American Board of Toxicology, 2021
Certified Industrial Hygienist, Boar for Global EHS Credentialing, 2023

PROFESSIONAL TRAININGS

40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Training
8-Hour HAZWOPER Refresher Training
8-Hour HAZWOPER Supervisor Training

Derek Drechsel, PhD, CIH, DABT

Principal Scientist | Toxicologist

EXPERIENCE SUMMARY

Dr. Drechsel is a board-certified toxicologist (DABT) and certified industrial hygienist (CIH) with more than fifteen years of experience in applied toxicology, industrial hygiene, product safety, and human health risk assessment. Dr. Drechsel has published more than 20 peer-reviewed articles and presented on various chemical-specific issues along with toxicology- and risk-related topics. He teaches undergraduate- and graduate-level courses at multiple universities and is a contributing member of the Society of Toxicology (SOT) and American Industrial Hygiene Association (AIHA).

TECHNICAL SPECIALTIES

Dr. Drechsel's has provided technical expertise for projects involving chemical exposure in occupational, environmental, and consumer settings. This includes exposure and human health risk assessments for substances included airborne particulates (asbestos, talc, silica), benzene and other volatile organic compounds, carbon monoxide, heavy metals, microbiological agents, microplastics, and pesticides both under regulatory protocols and in the context of litigation. Dr. Drechsel has experience in the evaluation and integration of multiple lines of scientific evidence to address general and specific causation matters in toxic tort matters. He has led teams in responding to industrial accidents and chemical releases to support decision making and protect worker and community health. Dr. Drechsel has experience in food and consumer product safety evaluations in providing proactive scientific support to assess potential human health risk and regulatory compliance as well as assisting with crisis management and recall decisions.

Dr. Drechsel's areas of expertise include:

- Toxicology evaluations
- Exposure assessment
- Human health risk assessment
- Toxic tort evaluations
- California Prop 65 evaluation
- Food, beverage, and consumer product safety
- Crisis management and communication
- Industrial hygiene site investigations

REPRESENTATIVE PROJECTS

Toxicology & Risk Assessment

- Conducted general- and specific-causation analyses based upon weight-of-evidence of epidemiology, animal toxicology, and mechanistic data to evaluate associations between disease and chemical exposure to a variety of substances, including asbestos, benzene, ethylene oxide, glyphosate, pesticides, silica, and talc.
- Evaluated acute and chronic health hazards for art materials in accordance with federal regulations including the Labeling of Hazardous Art Materials Act (LHAMA) and ASTM D-4236 toxicological guidance. Provided recommendations for precautionary warnings based on anticipated hazards.
- Designed and managed in silico, in vitro and in vivo experiments to assess the potential hazards (e.g., skin irritation, skin sensitization, hair loss) associated with dermal exposures to a personal care product.
- Performed laboratory studies on molecular mechanisms by which pesticides could impact reactive oxygen species metabolism and the subsequent damage to neurons underlying Parkinson's Disease. Identified specific characteristics of brain mitochondria that leave neurons more susceptible to oxidative damage by pesticides compared to other organs.

- Conducted extensive evaluation and interpretation of data to determine the role of reactive oxygen and nitrogen species in Parkinson's disease-related pesticide neurotoxicity and motor neuron loss contributing to ALS.
- Researched and evaluated state-of-the-art topics involving anthophyllite asbestos and historical regulations involving talc. Published perspectives on historical knowledge and current impacts in peer-reviewed manuscripts.

Crisis Management/Emergency Response

- Conducted hazard evaluations and human health risk assessments to support product crisis and recall decisions. Evaluated the potential risks associated with undeclared allergens, microbial and chemical contaminations of food, beverages, dietary supplements, personal care items, and products intended for children.
- Designed sampling plans and conducted air monitoring for workers and communities for multiple emergency response situations including railroad derailments, leaking tank cars, petroleum pipeline releases, industrial fires and chemical releases across the US. Used real-time and analytical methods to characterize air concentrations of chemicals or concern and provided recommendations to mitigate health risk among workers and community to stakeholders.
- Managed a large scale emergency response effort involving an elemental mercury spill in multiple parcel processing facilities in the southwestern US. Designed exposure assessment plans to monitor elemental mercury vapor during initial investigation and remediation efforts, as well as clearance sampling using analytical methods. Communicated response efforts to non-technical stake holders including management and employees during the response effort.
- 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 relevant stakeholders including environmental health professionals, members of the unified command, impacted employees and community members.
- Provided toxicological support to railroad employees, HazMat managers and emergency room attending physicians following railroad worker chemical exposures.
- Provided technical oversight and management of contact tracing team SARSCoV-2 (COVID-19) outbreaks at oil and gas facilities. Provided guidance to employer and employees for workplace and isolation/quarantine protocols to prevent/control spread in accordance with emerging science.

Food and Consumer Product Health Risk Assessments

- Provided guidance for compliance with California Proposition 65 warning requirements for numerous commercial and consumer products. Reviewed ingredients and manufacturing processes to identify chemicals of concern, derived Safe Harbor Levels for chemicals lacking such information, and performed exposure assessments for comparison to guidance values, as necessary. Advised clients on warning requirements related to heavy metals (e.g. lead, cadmium, arsenic), formaldehyde, methanol, methyl isobutyl ketone, furfuryl alcohol, acrylamide, and phthalates.
- Performed simulation study and analytical testing to evaluate potential off-gassing of formaldehyde from textile products and potential health risk to consumers.
- Performed comprehensive safety evaluation of a personal hair care product following reports of adverse events in consumers. Conducted hazard evaluations of constituent ingredients and formulated products for skin irritation, skin sensitization, and hair loss. Characterized risk to individual ingredients including preservatives, botanicals, and fragrances based on expected consumer use. Developed analytical methods to characterize chemical changes in the product under simulated conditions of use. Published findings in a series of peer-reviewed manuscripts. Prepared responses to address concerns of regulatory agencies.
- Developed guidance on the acceptability of prior chemical cargos during bulk shipment and transport of a food commodity to support food safety regulatory compliance. Applied a screening-level risk assessment approach to identify maximum acceptable residues of prior chemical cargos not expected to induce adverse human health effects in consumers. In addition, assessed potential for odor detection and recognition during industrial use based on odor thresholds.
- Evaluated consumer reported adverse events associated with consumption of fiber-containing foods. Performed a risk assessment for ingredients of concern and compared incidence rate to other food products using the FDA CAERS database.
- Performed an evaluation of the potential human health risks associated with energy drink consumption. Conducted extensive review of case reports and FDA data to identify reports of toxicity related to energy drink consumption. Identified individual risk factors, including pre-existing medical conditions and concurrent alcohol/drug use, that increased an individual's susceptibility to adverse events.

PUBLICATIONS

Monnot, A.D., K.M. Towle, E.S. Fung, R.M. Novick, D.J. Paustenbach, and D.A. Drechsel. 2019. A skin sensitization induction risk

assessment of common ingredients present in commercially available cleansing conditioners. Dermatitis. 30(2): 116-128.

Drechsel, D.A., K.M. Towle, E. Fung., R.M. Novick., D.J. Paustenbach, A.D. Monnot. 2018. Evaluation of skin sensitization induction potential from daily exposure to fragrances in personal care products. Dermatitis 29(6): 324-331.

Fung, E.S., D.A. Drechsel, K.M. Towle, R.M. Novick, D.J. Paustenbach, and A.D. Monnot. 2018. Tier-based skin irritation testing of hair cleansing conditioners and their constituents. Cutaneous and Ocular Toxicology 26: 1-4.

Fung, E.S., D.A. Drechsel, K.M. Towle, M.T. Hoang, R.M. Novick, C. Poteete, D.J. Paustenbach, and A.D. Monnot. 2018. Screening-level safety assessment of personal care product constituents using publicly available data. Cosmetics. 5(2):38.

Drechsel, D.A., K.M. Towle, E. Fung., R.M. Novick., D.J. Paustenbach, A.D. Monnot. 2018. Chemical stability analysis of hair cleansing conditioners under high-heat conditions experienced during hair styling processes. Cosmetics 5(1): 23.

Towle, K.M., Drechsel, D.A., E. Fung, R.M. Novick, D.J. Paustenbach, A.D. Monnot. 2018. A quantitative risk assessment of the skin sensitization induction potential of the Kathon CG preservative in rinse-off and leave-on personal care and cosmetic products. Dermatitis 29(3): 132-138.

Drechsel, D.A., C.A. Barlow, J.L. Bare, N.F. Jacobs, and J.L. Henshaw. 2018. Historical evolution of regulatory standards for occupational and consumer exposures to industrial talc. Reg Tox Pharm 91: 251-267.

Gaffney, S.H., M. Grespin, L. Garnick, D.A. Drechsel, R. Hazan, D.J. Paustenbach, and B.D. Simmons. 2017. Anthophyllite asbestos: state of the science review. J Appli Tox 37(1): 38-49.

Drechsel, D.A., C.H. Chang, R.A. Kitson, D. Siegel, q. You, D.S. Backos, C. Ju, C.J. Moody and D.R. Ross. 2014. 19-Substituted benzoquinone ansamycin heat shock protein-90 inhibitors: biological activity and decreased off-target toxicity. Mol Pharmacol 85(6): 849-857.

Trias, E., P. Diaz-Amarilla, D.A. Drechsel, E. Isasi, J.S. Beckman, S. Olivera-Bravo and L. Barbeito. 2013. Transdifferentation of microglia to abherrant astrocytes in an animal model of amyotrophic lateral sclerosis. Frontiers Cell Neurosci 7: 274.

Drechsel, D.A., A.G. Estevez, L. Barbeito and J.S. Beckman. 2012. Nitric oxide-mediated oxidative damage and the progressive demise of motor neurons in ALS. Neurotox Res 22(4): 251-264.

Durazo, S.A., R.S. Kadam, D.A. Drechsel, M. Patel and U.B. Kompella. 2011. Brain mitochondrial drug delivery: influence of drug physiochemical properties. Pharm Res 28(11): 2833-2847.

Cantu, D., R.E. Fulton, D.A. Drechsel and M. Patel. 2011. Mitochondrial aconitase knockdown attenuates paraquat-induced dopaminergic cell death via decreased cellular metabolism and release of iron and hydrogen peroxide. J Neurochem 118(1): 79-92.

Drechsel, D.A. and M. Patel. 2010. Respiration-dependent hydrogen peroxide removal in brain mitochondria via the thioredoxin/peroxiredoxin system. J Biol Chem 285(36): 27850-27858.

Drechsel, D.A. and M. Patel. 2009. Differential contribution of the mitochondrial respiratory chain to reactive oxygen species production by redox cycling herbicides implicated in parkinsonism. Tox Sci 112(2): 427-434.

Drechsel, D.A. and M. Patel. 2009. Paraquat-induced production of reactive oxygen species in brain mitochondria. Methods Enzymol 456: 381-93.

Chick, W.A., D.A. Drechsel, W. Hammond, M. Patel and T.E. Johnson. 2009. Transmission of mutant phenotypes from ES cells to adult mice. Mamm Genome 20(11-12): 734-40.

Drechsel, D.A. and M. Patel. 2008. Role of reactive oxygen species in the neurotoxicity of environmental agents implicated in Parkinson's disease. Free Radic Biol Med 44(11): 1873-86.

Castello, P.R., D.A. Drechsel, B.J. Day and M. Patel. 2007. Inhibition of mitochondrial hydrogen peroxide production by lipophilic metalloporphyrins. J Pharma Exp Ther 324(3): 970-976.

Castello, P.R., D.A. Drechsel and M. Patel. 2007. Mitochondria are a major source of paraquat-induced reactive oxygen species production in the brain. J Biol Chem 282(19): 14186-14193.

Drechsel, D.A., L.P. Liang and M. Patel. 2007. 1-Methyl4-phenylpyridinium-induced alterations of glutathione status in immortalized rat dopaminergic neurons. Toxicol Appl Pharmacol 220(3): 341-348.

Sampey, B.P., D.L. Carbone, J.A. Doorn, D.A. Drechsel and D.R. Petersen. 2007. 4-Hydroxy-2-nonenal adduction of extracellular signal-regulated kinase (Erk) and the inhibition of hepatocyte Erk-Est-like protein-1-activating protein-1 signal transduction. Mol Pharmacol 71(3): 871- 883.

SPEAKING ENGAGEMENTS

Drechsel, D.A., J. Hogan, A. Fitzpatrick, and M.C. Juliana. 2025. Microplastics: a Macro Problem? National Forum for Environmental and Toxic Tort Issues. Chicago, IL.

Drechsel, D.A. 2024. Paraquat and Parkinson's Disease – Laboratory Tool or Environmental Neurotoxin? National Forum for Environmental and Toxic Tort Issues. Chicago, IL.

Drechsel, D.A., M. Forrest, S. Sadoff, and G. Sperla. 2024. Perspectives on Navigating Increasing Cosmetic Contaminant Risk. Personal Care Products Council Legal and Regulatory Conference. Scottsdale, AZ

Jew, K., C. Fung, M. Venn, and D.A. Drechsel. 2023. Quantitative comparison of occupational and end-product user exposures to

cosmetic-grade talc dust. Society of Toxicology Annual Meeting. Salt Lake City, UT.

Drechsel, D.A. 2023. Mercury spill case study: the elements of a successful response. Rocky Mountain American Industrial Hygiene Association. Wheat Ridge, CO.

Drechsel, D.A. and C. Kuhlman. 2023. Effective Communication of Data When Preparing for and Responding to Smoke Incidents. Mountain West Society of Toxicology Annual Meeting and Rocky Mountain Wildfire Smoke Symposium. Aurora, CO.

Fung, D., K. Jew, M. Venn, and D.A. Drechsel. 2023. Quantitative comparison of occupational and end-product user exposures to cosmetic-grade talc dust. American Industrial Hygiene Conference and Exposition. Phoenix, AZ.

Drechsel, D.A., M. Lumpkin, and T.McMullin. 2023. Metal exposure associated with use of soil and fertilizer products in a commercial greenhouse setting with comparison to Proposition 65 Safe Harbor Levels. Society of Toxicology Annual Meeting, Nashville, TN.

Drechsel, D.A., T. Simoneau, and M. Lumpkin. 2023. Formaldehyde off-gassing from bed sheets and pillowcases: a simulation study. Society of Toxicology Annual Meeting. Nashville, TN.

Drechsel, D.A. 2020. Evaluation of adverse health claims related to dietary fiber using FDA CAERS database. Vahouny Fiber Symposium, International Life Sciences Institute North America.

Brown, S.E., M.R. Monroe, D.A. Drechsel, and R.N. Novick. 2019. Examining the impact of DEHP exposure via food on reproductive function in adult men. Society of Toxicology Annual Meeting. Baltimore, MD.

Monnot, A.D, S. Ahmed, A. Dickinson, D.A. Drechsel, K.M. Towle, D.J. Paustenbach, and E.S. Fung. 2019. An in vitro human assay for evaluating immunogenic and sensitization potential of personal care and cosmetic products. Society of Toxicology Annual Meeting. Baltimore, MD.

Towle, K.M., D.A. Drechsel, E.S. Fung, D.J. Paustenbach, and A.D. Monnot. 2019. Examination of the US FDA adverse event reporting system to assess the halo effect and potential reporting bias. Society of Toxicology Annual Meeting. Baltimore, MD.

Fung, E.S., D.A. Drechsel, K.M. Towle, D.J. Paustenbach, and A.D. Monnot. 2019. A tier-based skin sensitization testing strategy for personal care products. Society of Toxicology Annual Meeting. Baltimore, MD.

Drechsel, D.A. 2019. Scientific bases behind cosmetic and industrial talc regulations. DRI Talc Litigation Symposium, Washington, DC.

Drechsel, D.A. 2018. Calls for bans and warnings of cosmetic talc: what can we learn from 40+ years of FDA responses. Cardno ChemRisk Science Seminar, DRI Asbestos Medicine, Austin, TX.

Drechsel, D.A., R. Kitzan, and J. Prochnow. 2018. Anatomy of a food safety investigation. Rocky Mountain Dietary Supplement Conference, Boulder, CO.

Towle, K.M., S. Sehgal, N.F.B. Jacobs, D.A. Drechsel, E. Fung, and A.D. Monnot. 2018. A quantitative risk assessment of daily exposure to the cosmetic preservative Kathon CG via use of personal care products: utilization of the IH SkinPerm. American Industrial Hygiene Conference. Philadelphia, PA.

Drechsel, D.A., E.S. Fung, K.M. Towle, D.J. Paustenbach, and A.D. Monnot. Evaluating the phototoxic potential of a hair cleansing conditioner. Society of Toxicology Annual Meeting. Baltimore, MD.

Towle, K.M., D.A. Drechsel, E. Fung, R. Novick, D. Paustenbach, and A.D. Monnot. 2018. An evaluation of skin sensitization from daily exposure to preservatives in personal care products. Society of Toxicology Annual Meeting. San Antonio, TX.

Monnot, A.D., K.M. Towle, R. Novick, E. Fung, D. Paustenbach, and D.A. Drechsel. 2018. A skin sensitization risk assessment of common ingredients present in commercially available cleansing conditioners. Society of Toxicology Annual Meeting. San Antonio, TX.

Fung, E, R. Novick, D.A. Drechsel, K.M. Towle, D. Paustenbach, and A.D. Monnot. 2018. Tier-based safety testing of common person care products and their constituents. Society of Toxicology Annual Meeting. San Antonio, TX.

Drechsel, D.A., K.M. Towle, E. Fung, R. Novick, D. Paustenbach, and A.D. Monnot. 2018. Chemical stability of a cleansing conditioner product under high-heat conditions experienced during consumer use. Society of Toxicology Annual Meeting. San Antonio, TX.

Hoang, M, E. Fung, D.A. Drechsel, K.M. Towle, C. Poteete, D. Paustenbach, and A.D. Monnot. 2018. Screening-level safety assessment of personal care product constituent safety using publicly available data. Society of Toxicology Annual Meeting. San Antonio, TX.

Novick, R, K.M. Towle, D.A. Drechsel, E. Fung, D. Paustenbach, and A.D. Monnot. 2018. Dermal irritation hazard assessment of ingredients in Wen cleansing conditioner products. Society of Toxicology Annual Meeting. San Antonio, TX.

Drechsel, D.A., K.M. Towle, E. Fung, R. Novick, D. Paustenbach, and A.D. Monnot. 2018. An evaluation of skin sensitization induction from daily exposure to fragrances in person care products. Society of Toxicology Annual Meeting. San Antonio, TX.

Manning, C.M., D.A. Drechsel, B. Winans, F. Louie, B.E. Tvermoes and K.M. Unice. 2017. Determining the Acceptability of Prior Cargos in the Bulk Shipment of Food Commodity Chemicals. Society of Toxicology Annual Meeting, Baltimore, Maryland.

Drechsel, D.A., A.M. Banducci, M.L. Nelson, R. Novick, B.E. Tvermoes. 2016. Using reported adverse events to identify potential health risks and individual susceptibility associated with energy drink

consumption. Society of Toxicology Annual Meeting, New Orleans, LA.

Banducci, A.M., D.A. Drechsel, M.L. Nelson, R. Novick, and B.E. Tvermoes. 2014. Potential health risks associated with energy drink consumption and characterization of individual susceptibility factors. Society for Risk Analysis. Denver, CO.

Drechsel, D.A., C.H. Chang, R. Kitson, D. Siegel, C.J. Moody and D.R. Ross. 2014. 19-Substituted benzoquinone ansamycin Hsp90 inhibitors: Effects on Hsp90 cochaperones and Hsp90-Hsf1 complexes in cellular systems. American Association for Cancer Research Annual Meeting, San Diego, CA.

Drechsel, D.A., C.H. Chang, R.A. Kitson, D. Siegel, Q. You, D.S. Backos, C. Ju, C.J. Moody and D.R. Ross. 2014. 19-Substituted benzoquinone ansamycin heat shock protein-90 inhibitors: biological activity and decreased off-target toxicity. Society of Toxicology Mountain West Regional Chapter Annual Meeting, Albuquerque, NM.

Drechsel, D.A., J. Zielonka, B. Kalyanaraman and J.S. Beckman. 2012. Peroxynitrite formation from re-oxidation of zinc-deficient superoxide dismutase. Society for Free Radical Biology and Medicine Annual Meeting, San Diego, CA.

Drechsel, D.A. and J.S. Beckman. May 2011. Examining the paradoxical role of copper, zinc-superoxide dismutase using a boronate-based fluorescent probe for peroxynitrite. Center for Excellence for Research on Complementary and Alternative Medicine Antioxidant Therapies Seminar, Corvallis, OR

Drechsel, D.A., J. Zielonka, B. Kalyanaraman and J.S. Beckman. 2011. Examining the role of superoxide dismutase on peroxynitrite formation and tyrosine nitration using a fluorescent probe specific for peroxynitrite. Society of Toxicology 50th Annual Meeting, Washington, DC.

Drechsel, D.A., L.P. Liang and M. Patel. 2010. Brain mitochondria remove hydrogen peroxide via a respiration and thioredoxin-dependent mechanism. Society for Neuroscience Annual Meeting, San Diego, CA.

Drechsel, D.A., L.P. Liang and M. Patel. 2010. Brain mitochondria remove hydrogen peroxide via a respiration and thioredoxin-dependent mechanism. Society of Toxicology 49th Annual Meeting, Salt Lake City, UT.

Drechsel, D.A. and M. Patel. June 2009. Respiration dependent H_2O_2 removal in brain mitochondria via the thioredoxin system. University of Colorado Department of Pharmaceutical Sciences Annual Retreat, Estes Park, CO.

Drechsel, D.A. and M. Patel. 2009. Differential contributions of the mitochondrial respiratory chain complexes to reactive oxygen species production by redox cycling agents implicated in Parkinsonism. Society of Toxicology 48th Annual Meeting, Baltimore, MD.

Drechsel, D.A. and M. Patel. 2008. Mitochondrial mechanisms of ROS production and oxidative stress by redox cycling herbicides implicated in Parkinsonism. Society for Neuroscience Annual Meeting, Washington, D.C.

Drechsel, D.A., K.R. Ryan, L.P. Liang and M. Patel. 2008. Mitochondrial mechanisms of ROS production and oxidative stress by redox cycling herbicides implicated in Parkinson's disease. Society of Toxicology 47th Annual Meeting, Seattle, WA.

Drechsel, D.A. and M. Patel. June 2007. Mitochondrial mechanisms of ROS generation by redox cycling herbicides. University of Colorado Department of Pharmaceutical Sciences Annual Retreat, Estes Park, CO.

Castello, P.R., D.A. Drechsel and M. Patel. 2006. Mitochondria are the major source of paraquat-induced reactive oxygen species in the brain. Society for Free Radical Biology and Medicine's 13th Annual Meeting, Denver, CO.

Drechsel, D.A., L.P. Liang and M. Patel. 2006. 1-methyl4-phenylpyridinium-induced alteration of glutathione and redox status in immortalized rat dopaminergic neurons. 23rd International Neurotoxicology Conference, Little Rock, AR.

Drechsel, D.A., Q. Li and D. Schlessinger. August 2001. Expression of a novel RING zinc finger protein in mouse embryonic development relating to premature aging syndrome. National Institute on Aging and National Institutes of Health Student Poster Days, Baltimore and Bethesda, MD.