

**Colleen A. Cushing**  
**Managing Scientist**

**Professional Profile**

Ms. Colleen Cushing is a Managing Scientist in Exponent's Health Sciences Center for Occupational and Environmental Health. She has 15 years of experience in human health risk assessment, exposure assessment, and data analysis. Ms. Cushing is experienced in conducting multi-pathway human health risk assessments of industrial, residential, and recreational scenarios, using site-specific data from soils, groundwater, and surface water for both organic and inorganic chemicals. As part of these assessments, she has presented to groups of potentially responsible parties and negotiated with regulators. She has managed investigations of brain cancer clusters, and has provided support to occupational exposure assessments and critical reviews of epidemiologic literature. She is also experienced in conducting assessments for consumer products and children's health, often involving novel exposure pathways. She has conducted an exposure assessment for a brominated flame retardant under EPA's pilot Voluntary Children's Chemical Evaluation Program (VCCEP), which included an evaluation of breast milk ingestion, and the use of biomonitoring data and a pharmacokinetic model. She also evaluated children's potential risk from CCA-treated wood, and one of its replacement products, ACQ-treated wood, which included estimating potential intake from residue on the wood surface. In her assessments, she has incorporated results from EPA's child lead model, the Integrated Exposure and Uptake Biokinetic model, the Johnson-Ettinger vapor intrusion model, and air dispersion models. She has also done state-of-the-science literature reviews for aspects relating to tremolite asbestos, as well as manganese exposure from welding.

**Academic Credentials and Professional Honors**

B.S., Mathematics and Philosophy, Willamette University, (*magna cum laude*), 1988

## **Publications**

Budinsky RA, Rowlands JC, Casteel S, Fent G, Cushing CA, Newsted J, Ruby MV, Aylward LL. A pilot study of oral bioavailability of dioxins and furans from contaminated soils: impact of differential hepatic enzyme activity and species differences. *Chemosphere*, 2008 Feb; 70(10):1774–1786.

Cushing CA, Golden R, Lowney YW, Holm SE. Human health risk evaluation of ACQ-treated wood. *Human and Ecological Risk Assessment* 2007; 13(5):1014–1041.

Lowney YW, Wester RC, Schoof RA, Cushing CA, Edwards M, Ruby MV. Percutaneous absorption of arsenic from soils as measured in the Rhesus monkey. *Toxicological Sciences* 2007, 100(2):381–392.

Santamaria AB, Cushing CA, Antonini J, Finley BL, Mowat FS. State-of-the-science review: Does manganese exposure during welding pose a neurological risk? *J Toxicol Environ Health Part B*, 2007; 10:417–465.

Aylward LL, Brunet RC, Carrier G, Hays SM, Cushing CA, Needham LL, Patterson Jr DG, Gerthoux PM, Brambillah P, Mocarelli P. Concentration-dependent TCDD elimination kinetics in humans: toxicokinetic modeling for moderately to highly exposed adults from Seveso, Italy, and Vienna, Austria, and impact on dose estimates for the NIOSH cohort. *J Exp Anal Environ Epidemiol* 2005; 15(1):51–65.

Pyatt DW, Hays SM, Cushing CA. Do children have increased susceptibility for developing secondary acute myelogenous leukemia? *Chem Biol Interact* 2005 May 30; 153–154:223–229. Erratum in: *Chem Biol Interact* 155(3):191 (poster paper).

Williams PRD, Cushing CA, Sheehan PJ. Data available for evaluating the risks and benefits of MTBE and ethanol as alternative fuel oxygenates. *Risk Anal* 2003; 23(5):1085–1115.

Hays SM, Cushing CA, Leung H-W, Pyatt DW, Holicky KC, Paustenbach DJ. Exposure of infants and children in the U.S. to the flame retardant decabromodiphenyl oxide (DBDPO). *J Child Health* 2003; 1(4):449–475.

## **Presentations**

Cushing CA, Lowney YW, Golden RJ, Holm SE. Human health based evaluation of chemical exposures from ACQ-treated wood. Poster presented at the 45<sup>th</sup> Annual Meeting of the Society for Toxicology, San Diego, CA, March 2006.

Pyatt DW, Hays S, Cushing C. Are there age related differences in children's susceptibility for developing secondary acute myelogenous leukemia? *The Toxicologist*, 84(S-1):53. Poster No. 258 presented at the Society of Toxicology's 44th Annual Meeting New Orleans, LA, 2005.

Cushing CA, Santamaria AB. Promises and pitfalls of biomonitoring data. Oral presentation at the Society for Risk Analysis 24th Annual Meeting, Palm Springs, CA, December 2004.

Pyatt DW, Hays SM, Cushing CA. Do children have increased susceptibility for developing secondary acute myelogenous leukemia? Poster presented at the International Symposium on Recent Advances in Benzene Toxicity, Munich, Germany, October 2004.

Santamaria A, Li A, Mowat FS, Cushing CA, Finley B. Potential neurological effects of manganese exposure during welding: a state-of-the-science review. *Toxicologist* 78(S-1):394. Poster presented at the 43rd Annual Meeting of the Society for Toxicology, March 2004.

Cushing CA, Hays SM. A screening-level VCCEP exposure assessment for decabromodiphenyl oxide (DBDPO). Oral presentation at the Society for Risk Analysis, 23rd Annual Meeting, Baltimore, MD, December 2003.

Williams PRD, Cushing C, Sheehan P. Evaluating the risks and benefits of MTBE and ethanol as alternative fuel oxygenates. Presented at the Society for Risk Analysis 23rd Annual Meeting, Baltimore, MD, December 2003.

Aylward LL, Hays SM, Brunet RC, Carrier G, Cushing CA. Impact of a concentration-dependent elimination rate for TCDD on dose estimates for the NIOSH cohort. Presented at Dioxin 2003, August 2003.

Hays SM, Cushing CA, Pyatt DW, Holicky KC, Paustenbach DJ. Exposure of infants and children in the U.S. to the flame retardant decabromodiphenyl oxide (DBDPO). Presented at Dioxin 2003, August 2003.

Cushing CA, Holicky KC, Pyatt DW, Staskal D, Finley BL, Paustenbach DJ, Hays SM. Estimated children's exposure to decabromodiphenyl oxide in the U.S. Poster presented at the Society for Toxicology, March 2003.

Lowney Y, Schoof R, Cushing C. Estimating adult blood lead concentrations in residents exposed via inhalation. Poster presented at the Society for Risk Analysis, December 1997.