

Biographical Summary

Christopher M. Long, Sc.D., Principal Scientist, Air Quality & Environmental Health

Dr. Long is an expert in the area of exposure and risk assessment, with particular expertise in indoor and outdoor air pollution, inhalation toxicology, air pollution epidemiology, air sampling and measurement, and air modeling. He has assessed exposures and health risks associated with airborne particulates such as diesel exhaust particulates, carbon black, coal ash, ambient sulfates and nitrates, asbestos, ambient ultrafines, engineered nanoparticles, lead and other trace elements, and bioaerosols, as well as with numerous gaseous criteria and hazardous air pollutants. Dr. Long's practice area includes evaluating product safety, with specific interests in airborne exposures and engineered nanoparticles, and he is a technical editor of Gradient's nanotechnology newsletter, EH&S Nano News. Dr. Long also has a particular interest in the historical evolution of air pollution science and regulation.

Dr. Long has prepared approximately 40 technical papers and presentations in the general areas of indoor and outdoor air pollution and exposure assessment. He is a member of the International Society of Exposure Science, the Air and Waste Management Association, and the American Chemical Society.

Representative Projects

Air Toxics Health Risk Characterization: At the request of the New Mexico Environment Department (NMED), prepared a community acute health risk assessment associated with inhalation exposures to over 80 air toxics using air monitoring and modeling data.

Potential Mercury Risks from Building Materials Containing CCPs: For the Electric Power Research Institute (EPRI), assessed potential mercury releases and inhalation risks associated with the beneficial use and disposal of coal combustion products (CCPs) in building materials (wallboard, concrete).

Coal Ash Risk Assessment and Public Communications: For a utility company, prepared a multi-pathway human health risk assessment evaluating potential exposures of nearby residents to a coal ash disposal site. Prepared a white paper on coal ash for public dissemination.

Commercial Printer Product Safety Evaluation: Designed a comprehensive measurement program to assess potential exposures associated with the use of a commercially available printer. Assessed toxicological significance of indoor air and surface wipe measurements.

Indoor/Outdoor PM_{2.5} Sampling and Exposure Assessment: Designed and implemented an indoor/outdoor PM_{2.5} sampling program in residential homes near a large industrial facility to investigate source contributions to individual particulate matter exposures.

Modeling Analysis of Power Plant Mercury Emissions for Toxic Tort Case: As part of a multidisciplinary effort, conducted an air modeling analysis of mercury emissions, dispersion, and deposition from several coal-fired power plants using US EPA regulatory air models CALPUFF and ISCST3. Used the model results to assess the power plant impacts relative to other local/regional/global mercury sources.



Practice Areas & Expertise

- Exposure and Risk Assessment
- Indoor/Outdoor Air Pollution
- Air Sampling, Measurement, & Modeling
- Consumer Product Safety
- Nanotechnology

Education

Sc.D., Environmental Health, Harvard School of Public Health

M.S., Environmental Engineering, MIT

A.B., Chemistry and Environmental Studies, Bowdoin College

Selected Publications

Hesterberg, TW; Long, CM; Bunn, WB; Sax, SB; Lapin, CA; Valberg, PA. 2009. "Non-cancer health effects of diesel exhaust (DE): critical assessment of recent human and animal toxicological literature." *Crit. Rev. Toxicol.* 39(3):195-227.

Valberg, PA; Long, CM; Sax, SN. 2006. "Integrating studies on carcinogenic risk of carbon black: Epidemiology, animal exposures, and mechanism of action." *J. Occup. Environ. Med.* 48(12):1291-1307.

Long, CM; Seeley, M; Beck, BD. 2005. "Tiny particles, large data gaps: A risk assessment perspective on nanotechnology." *Risk Policy Report* 12:12-14.

Long, CM; Sarnat, JA. 2004. "Indoor-outdoor relationships and infiltration behavior of elemental components of outdoor PM_{2.5} for Boston-area homes." *Aerosol Science & Technology* 38(S2):91-104.

Long, CM; Suh, HH; Kobzik, L; Catalano, PJ; Ning, Y; Koutrakis, P. 2001. "A pilot investigation of the relative toxicity of indoor and outdoor fine particles: *In vitro* effects of endotoxin and other particulate properties." *Environ. Health Perspect.* 109(10):1019-1026.



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