

Fionna S. Mowat, Ph.D.
Principal Scientist

Professional Profile

Dr. Fionna S. Mowat is a Principal Scientist in Exponent's Health Sciences Center for Exposure Assessment and Dose Reconstruction. Dr. Mowat is a risk assessment practitioner who specializes in exposure assessment. She has over 10 years of multidisciplinary experience in the fields of ecological and human health risk assessment, primarily focusing on exposure assessment. Dr. Mowat has conducted human health risk assessments for various chemicals, including asbestos, various nanomaterials (e.g., metal oxides, carbon nanotubes), hexavalent chromium, lead, and manganese. Currently, her primary areas of interest are exposure assessment from various chemicals, mineral fibers, and nanoparticles in occupational settings, and evaluating potential exposures resulting from use (and misuse) of consumer products (e.g., mastics/adhesives, phenolic compounds, friction products [i.e., brakes and clutches], jewelry, roofing materials, gaskets, and children's toys). In particular, Dr. Mowat has been involved in the design, conduct, and publication of exposure simulation tests designed to simulate historical exposures to products that were manufactured and used during a time when no air samples were collected and industrial hygiene data were unavailable. Dr. Mowat also has significant experience in exposure assessment of nanomaterials in occupational settings and in consumer products, with particular focus on mixed metal oxides and carbon nanotubes. Dr. Mowat has performed several reviews of products containing mixed metal oxides, such as personal care items, and has presented a risk assessment framework for assessing exposures to nanomaterials in consumer products. She also recently published a book chapter summarizing the exposure and toxicology studies to aid in evaluation of potential risk of nanomaterials resulting from use of consumer products.

Dr. Mowat had also designed, led, and conducted various pharmacoepidemiologic projects, including analyses of clinical data, claims records, and electronic medical or health records (EMR/EHR); literature review of various diseases and conditions, particularly as they relate to identification of market share; and life-cycle management assessment for various diseases and drugs. As part of this research, Dr. Mowat has performed epidemiologic evaluations of rare bone and blood conditions in various subpopulations, investigated the clinical and economic burden and risk factors associated with various cancer outcomes, evaluated standards of care in breast and ovarian cancer patients, and described the healthcare utilization for different subpopulations. Dr. Mowat summarized this work in written manuscripts and has contributed to epidemiologic and other sections of regulatory documents for use in both the U.S. and Europe.

Dr. Mowat also has experience with chemical and toxicological characterizations of sediment mixtures bioavailability analysis of metals, and interpretation of bioassays. Dr. Mowat is also trained in biomedical engineering.

Academic Credentials and Professional Honors

Ph.D., Biomedical Engineering, Tulane University, 2000

B.S.E., Biomedical Engineering, Duke University, 1994

Licenses and Certifications

Engineer-in-Training (EIT) certification, 1996

SCUBA certification, PADI, 1988

Languages

French, Spanish

Publications

Lau E, Mowat FS, Kelsh MA, Legg JC, Engel-Nitz NM, Watson HN, Collins HL, Nordyke RJ, Whyte JL. Use of electronic medical records (EMR) for oncology outcomes research: Assessing the comparability of EMR information to patient registry and claims data. *Clin Epi* 2011; 3:259–272.

Sheehan P, Mowat F, Weidling R, Floyd M. Simulation tests to assess occupational exposure to airborne asbestos exposures from artificially weathered asphalt-based roofing products. *Ann Occup Hyg* 2010; 54:880–892. Corrigendum in *Ann Occup Hyg* 2011; 55:827.

Yong, M, Schoonen WM, Li L, Kanas G, Coalson J, Mowat F, Fryzek J, Kaye JA. Pediatric immune thrombocytopenic purpura in the General Practice Research Database. *Br J Haematol* 2010; 149 (6):855–864.

Morimoto L, Coalson J, Mowat F, O'Malley C. Factors affecting treatment decision making in receipt of chemotherapy for metastatic breast cancer: A review of the literature. *Int J Women's Health* 2010; 2:107–122.

Kanas G, Morimoto L, Mowat F, O'Malley C, Fryzek J, Nordyke R. Use of electronic medical records in outcomes research. *ClincoEcon Outcomes Res* 2010; 2:1–14.

Schoonen WM, Kucera G, Coalson J, Li L, Rutstein M, Mowat F, Fryzek J, Kaye JA. Epidemiology of immune thrombocytopenic purpura in the General Practice Research Database. *Br J Haematology* 2009; 145 (2):235–244.

Kurtz SM, Ong K, Schmier J, Zhao K, Mowat F, Lau E. Primary and revision arthroplasty surgery caseloads in the United States from 1990 to 2004. *J Arthroplasty* 2009; 24(2):195–203.

Kurtz SM, Ong K, Schmier J, Mowat F, Saleh K, Dybvik E, Kärrholm J, Garellick G, Havelin L, Furnes O, Malchau H, Lau E. Future clinical and economic impact of revision total hip and knee arthroplasty. *J Bone Joint Surg Am* 2007; 89:144–151.

Kelsh MA, Craven VA, Teta MJ, Mowat FS, Goodman, M. Mesothelioma in vehicle mechanics: is the risk different for Australians? *Occupational Medicine* 2007; 57:581–589.

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.

Mowat F, Weidling R, Sheehan P. Simulation tests to assess occupational exposure to airborne asbestos from asphalt-based roofing products. *Ann Occup Hyg* 2007; 51:451–462.

Finley BL, Richter RO, Mowat FS, Mlynarek S, Paustenbach DJ, Warmerdam JL, Sheehan PJ. Cumulative asbestos exposure for U.S. automobile mechanics involved in brake repair (circa 1950s–2000). *J Exp Sci Environ Epidemiol* 2007; 17:644–655.

Clarke C, Mowat F, Kelsh M, Roberts M. Pleural plaques: Review of diagnostic issues and possible non-asbestos etiologies. *Arch Environ Health: An Int J* 2007; 61(4):183–192.

Kurtz SM, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *J Bone Joint Surg Am* 2007; 89:780–785.

Ong K, Mowat F, Chan N, Lau E, Halpern M, Kurtz S. Economic burden of revision hip and knee arthroplasty in Medicare enrollees. *Clin Orthop Relat Res* 2006; 446:22–28.

Mowat FS, Bono M, Lee RJ, Tamburello S, Paustenbach D. Occupational exposure to airborne asbestos from phenolic molding material (Bakelite) during sanding, drilling, and related activities. *J Occup Environ Hyg* 2005; 2:497–507.

Kurtz S, Mowat F, Ong K, Chan N, Lau E, Halpern M. Prevalence of primary and revision total hip and knee arthroplasty in the United States (1990–2002). *J Bone Joint Surg Am* 2005; 87:1487–1497.

Paustenbach DJ, Sage A, Bono M, Mowat F. Occupational exposure to airborne asbestos from coatings, mastics, and adhesives. *J Exp Anal Environ Epidemiol* 2004; 14(3):234–244.

Paustenbach DJ, Finley BL, Mowat FS, Kerger BD. Human health risk and exposure assessment of chromium (VI) in tap water. *J Toxicol Environ Health Part A* 2003; 66(14):1295–1339.

Mowat FS, Bundy KJ. A mathematical algorithm to identify toxicity and prioritize pollutants in field sediments. *Chemosphere* 2002; 49(5):499–513.

Mowat FS, Bundy KJ. Experimental and mathematical/computational assessment of the acute toxicity of chemical mixtures from Microtox[®] assay. *Adv Environ Res* 2002; 6(4):547–558.

Mowat FS, Bundy KJ. Correlation of field-measured toxicity with chemical concentration and pollutant availability. *Environ Internat* 2001; 27(6):479–489.

Book Chapters

Tsuji JS, Mowat FS, Donthu S, Reitman M. Application of toxicology studies in assessing the health risks of nanomaterials in consumer products. Chapter 25. In: *Nanotoxicity: In vivo and in vitro models to health risks*. Sahu SC, Casciano DA (eds), Wiley, 2009.

Mowat F, Shum M, Kelsh M. Exposure assessment. pp. 369–373. In: *Encyclopedia of Epidemiology*, Sage Publications, Thousand Oaks, CA, 2007.

Bundy K, Mowat F, Taverna P, Shettlemore M. Measurement of pollution distribution toxicity and effectiveness of emerging soil remediation techniques. pp. 113–154. In: *Remediation Engineering of Contaminated Soils, Second Edition*. Wise DL, Trantolo DJ, Cichon EJ, Inyang HI, and Stottmeister U (eds), Marcel Dekker Inc., New York, NY, 2000.

Articles

Tsuji JS, Duggan A, Mowat F. Beyond buckyballs – Nanomaterial product development amidst regulatory uncertainty. *Exponent Health Sciences News Release* 2012; 12.

Mowat F, Tsuji J. Carbon nanotubes: The next asbestos? *Toxic Torts and Environmental Litigation Committee Fall Newsletter* 2009. Pages 1, 18–20.

Mowat F, Tsuji J. Primer on emerging health and environmental issues for nanomaterials. *Michigan Defense Trial Counsel Law Quarterly* 2006; 23(3):26–30.

Sheehan PJ, Mowat FS, Tarry, Jr., SL. Havner, mechanics, and asbestos friction products: A convincing science case. *Environmental Litigation and Toxic Torts Committee Newsletter* 2005; 8(1).

Selected Invited Presentations

Mowat F. Nanotechnology update: Toxic cosmetics? Presented to the American Bar Association Tort Trial & Insurance Practice Section, Toxic Torts and Environmental Law Committee, Phoenix, AZ, March 31–April 2, 2011.

Mowat F. Nano-size me: Responsible development of nanomaterials. Presented at the Defense Research Institute (DRI) Product Liability Conference – It’s Not Easy Being Green: Navigating the New Landscape of Product Liability Law, San Diego, CA, April 15–17, 2009.

Mowat F. Size *does* matter: The impact of nanotechnology on human health and the environment. Presented to the American Bar Association Tort Trial & Insurance Practice Section, Toxic Torts and Environmental Law Committee, Phoenix, AZ, April 2–4, 2009.

Mowat FS. Carbon nanotubes: What the heck are they? Presented at the California section of the American Chemical Society, Oakland, CA, September 17, 2008.

Kelsh MA, Mowat FS. Epidemiology, exposure, and risk assessment: The story of asbestos friction products. Presented at the Associated Defense Counsel of California and Nevada, San Francisco, CA, April 29, 2008.

Mowat FS. Nanomaterials: What are they and why should I care? Presented at the Defense Trial Counsel of Indiana, Lafayette, IN, November 17–19, 2006.

Mowat FS. Health, safety, and risk management of nanomaterials. Panel speaker and moderator. Presented at the Society for the Advancement of Materials and Process Engineering (SAMPE), Dallas, TX, November 6–9, 2006.

Tsuji JS, Mowat FS. Risk assessment of nanoscale metal particles. Presented at the Environmental Protection Agency (EPA) Region 5 Nanotechnology for Site Remediation Workshop, Chicago, IL, September 6–7, 2006.

Mowat FS. Nanomaterials: Emerging health and environmental issues. Presented at the Ohio Association of Civil Trial Attorneys Summer Meeting. Dayton, OH, June 15–16, 2006.

Mowat FS, Sheehan PJ. Estimating asbestos exposures from historical products: Issues related to industrial hygiene and toxicology. Presented at the Andrews Asbestos Litigation Conference, San Antonio, TX, April 26–27, 2006.

Mowat FS. Nanomaterials 101. Guest lecture for course entitled “Exposure Assessment for Occupational and Environmental Epidemiology.” Presented at the University of California, Los Angeles, Los Angeles, CA, February 21, 2006.

Mowat FS. Estimating human exposures from consumer products. Guest lecture for course entitled “Exposure Assessment for Occupational and Environmental Epidemiology.” Presented at the University of California, Los Angeles, Los Angeles, CA, February 21, 2006.

Mowat F. Nanotoxicity: Lessons learned from other small particles and fibers. Presented at the MIT/Stanford/U.C. Berkeley Nanotechnology Forum at swissnex. Nanotechnology Applications and Implications: A Focus on the Health and Environmental Effects of Nanomaterials, San Francisco, CA, December 7, 2005.

Mowat FS. Nanomaterials: Emerging health and environmental issues. Presented at the 2005 Annual Meeting of the DRI. Chicago, IL, October 19–23, 2005.

Mowat F. Exposure simulation studies of historical work environments. Presented at the AIHce Round Table RT226, “Asbestos: Everything Old is New Again – An Updated on Recent Research Regarding Asbestos Exposure and Health Risks,” Anaheim, CA, May 23–26, 2005.

Published Abstracts of Presentations

Mowat FS, Lau EL, Kelsh MA, Legg J, Engel-Nitz NM, Watson HN, Collins H, Nordyke RJ, Whyte JL. Assessing the comparability of electronic medical records information to tumor registry and health claims data for oncology outcomes research. Abstract 546. *Pharmacoepidemiol Drug Safety* 20(Supp 1):S238. Presented at the 27th International Conference on Pharmacoepidemiology and Therapeutic Risk Management (ICPE), Chicago, IL, August 14–17, 2011.

Lau EL, Legg J, Watson HN, Steffey D, Mowat FS, Kelsh MA. The problem of missing data: Using imputation methods to facilitate oncology outcomes research across four databases. Abstract 631 *Pharmacoepidemiol Drug Safety* 20(Supp 1):S275–276. Presented at the 27th ICPE, Chicago, IL, August 14–17, 2011.

Taylor A, Kanas G, Primrose JN, Langeberg WJ, Alexander DD, Kelsh MA, Mowat F, Choti MA, and Poston G. Survival after surgical resection of hepatic metastases from colorectal cancer: An updated review and meta-analysis. Presented at the 13th World Congress on Gastrointestinal Cancer, Barcelona, Spain, June 22–25, 2011.

Lau EL, Mowat FS, Kelsh MA, Legg J, Engel-Nitz NM, Watson HN, Collins H, Nordyke RJ, Whyte JL. Use of electronic medical records (EMR) for oncology outcomes research: Assessing the comparability of EMR information to patient registry and health claims data. *Value in Health* 2011; 14:A178. Presented at the 16th Annual Meeting of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), Baltimore, MD, May 21–25, 2011.

Sheehan PJ, Mowat F. Simulation tests of occupational asbestos exposures from removal of artificially weathered roof coating and cements. Presented at the American Industrial Hygiene Conference & Expo (AIHce), Portland, OR, May 14–19, 2011.

Taylor A, Langeberg WJ, Primrose JN, Kanas G, Kelsh MA, Mowat F, Choti M, Poston G. Survival after surgical resection of hepatic metastases from colorectal cancer: A systematic review and meta-analysis. Presented at the European Society for Medical Oncology (ESMO), Milan, Italy, October 8–12, 2010.

Goswami E, Craven V, Dahlstrom D, Mowat F. Domestic asbestos exposures: A review of epidemiologic and exposure data. Presented at the AIHce, Denver, CO, May 22–27, 2010.

Kelsh MA, Berman DW, Lau E, Kelly C, Lundin J, Mowat F. NOA in California and mesothelioma: Is there a link? Presented at the Geological Society of American National Annual Meeting, “Issues surrounding exposure to asbestos and other potentially hazardous fibrous minerals occurring in their natural settings,” Portland, OR, October 21, 2009.

Tsuji J, Mowat F. Application of toxicology studies for risk assessment in the real world. Presented at the 47th Annual Meeting of the Society of Toxicology (SOT). Workshop entitled,

“Agglomeration versus dispersion: How nanoparticle behavior affects exposure and toxicity *in vitro*, *in vivo*, and the real world,” March 15–19, 2009.

Malzahn D, Mowat F, Armstrong P. Simulation of asbestos release during dismantling of a residential sectional boiler. Presented at AIHce, Minneapolis, MN, June 2–5, 2008.

Mowat F. Emerging issues in health risk assessment of nano-engineered materials. Presented at the Northern California Society for Risk Analysis, Fall Symposium on Risk Assessment in Homeland Security and Emerging Risk Assessment Issues. Berkeley, CA, October 4, 2007.

Tsuji JS, Mowat F. Exposure and toxicity of nanotechnology in products. Presented at SAMPE. Baltimore, MD, June 3–7, 2007. Co-chair and moderator.

Mowat FS, Hartzell AL, da Silva MG, Tsuji J. Health risk assessment of products containing nano-engineered materials. Abstract 993. Presented at the 10th Annual National Standards and Technology Institute (NSTI) Nanotechnology Conference and Trade Show. Santa Clara, CA, May 20–24, 2007.

Mowat FS, Hartzell AL, da Silva MG, Tsuji J. Health risk assessment of products containing nano-engineered materials. Abstract 993. Presented at 10th Annual National Standards and Technology Institute (NSTI) Nanotechnology Conference and Trade Show, Santa Clara, CA, May 20–24, 2007.

Mowat FS, Tsuji JS. Assessment of health risks of carbon nanotubes: Where do we go from here? Presented at the 46th Annual Meeting of SOT. Workshop entitled, “Health risks of carbon nanotubes: What can we learn from mineral fibers or ultrafine particulates?” Charlotte, NC, March 25–29, 2007.

Tsuji JS, Mowat FS. Introduction to carbon nanotubes and health concerns. Presented at the 46th Annual Meeting of SOT. Workshop entitled, “Health risks of carbon nanotubes: What can we learn from mineral fibers or ultrafine particulates?” Charlotte, NC, March 25–29, 2007.

Kurtz S, Ong K, Schmier J, Mowat F, Saleh H, Malchau H, Lau E. Future clinical and economic impact of revision THA and TKA. Scientific exhibit presented at the 74th Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), SE 49, San Diego, CA, February 14–17, 2007.

Ong KL, Mowat FS, Lau E, Saleh KJ, Schmier J, Kurtz SM. Projected economic burden of revision THA and TKA for Medicare enrollees in the next decade. Presented at the 74th Annual Meeting of the AAOS. Paper No. 22, San Diego, CA, February 14–17, 2007.

Kurtz S, Ong K, Schmier J, Mowat F, Lau E. The surgeons’ revision burden: analysis of caseload disparities in the United States from 1990 to 2003. Presented at the 74th Annual Meeting of the AAOS. Poster P134, San Diego, CA, February 14–17, 2007.

Brorby G, Kalmes R, Goswami E, Mowat F, Sheehan P. Evaluating exposures to consumer products. Presented at the Society for Risk Analysis (SRA). Abstract W.3-I.2, Baltimore, MD, December 3–6, 2006.

Lau E, Kurtz S, Mowat F, Ong K, Halpern M. Survival of total hip and knee arthroplasty in the Medicare population in the U.S. Presented at the 16th Annual Meeting of the American Association of Hip and Knee Surgeons (AAHKS), Dallas, TX, November 3–5, 2006.

Tsuji J, Mowat F. Assessment of products containing nanomaterials. Symposium entitled, “Regulating nanotechnology: Developing stakeholder consensus for future rulemaking by EPA, FDA and OSHA.” Presented at the Division of Chemistry and the Law of the 232nd American Chemical Society National Meeting. San Francisco, CA, September 10–14, 2006.

Sheehan P, Mowat F, Weidling R. Simulation of asbestos release from asphalt-based roofing products. Presented at the American Industrial Hygiene Conference & Expo (AIHce), Chicago, IL, May 13–18, 2006.

Mowat FS, Tsuji J. Nanotechnology and the water market: Applications and health effects. Abstract 747. Presented at the 9th Annual National Standards and Technology Institute (NSTI) Nanotechnology Conference and Trade Show, Volume 2, pp. 416–419, Boston, MA, May 7–11, 2006.

Tsuji J, Mowat F, Kaetzel R. Approaches for risk assessment and risk management of nanomaterials: “Inert” metal oxides. *Toxicologist* 90(1), Abstract 2201. Presented at the 45th Annual Meeting of SOT, San Diego, CA, March 5–9, 2006.

Ong KL, Lau EL, Mowat FS, Kurtz SM, Chin KR, Villarraga ML. Changes in revision spine fusion rates at all levels in the United States from 1990–2003. Poster No. P394 presented at the 73rd Annual Meeting of the AAOS, Chicago, IL, March 22–26, 2006.

Lau E, Mowat F, Ong K, Zhao K, Halpern M, Kurtz S. The future burden of hip and knee revisions: U.S. projections from 2005 to 2030. Paper No. PAPR403 presented at the 73rd Annual Meeting of the AAOS, Chicago, IL, March 22–26, 2006.

Lau E, Mowat F, Ong K, Halpern M, Kurtz S. The future burden of hip and knee revisions: U.S. projections from 2005 to 2030. Scientific exhibit No. SE53 presented at the 73rd Annual Meeting of the AAOS, Chicago, IL, March 22–26, 2006.

Kurtz SM, Lau E, Ong K, Mowat F, Halpern M. Nationwide trends in revision surgery caseload in the U.S. from 1990 to 2003. Paper No. 179 presented at the 52nd Annual Meeting of the Orthopedic Research Society (ORS), Chicago, IL, March 19–22, 2006.

Kurtz SM, Lau E, Ong K, Mowat F, Halpern M. The future revision burden in the United States: National projections from 2005 to 2030. Paper No. 1576 presented at the 52nd Annual Meeting of ORS, Chicago, IL, March 19–22, 2006.

Ong KL, Lau EL, Mowat FS, Kurtz SM, Chin KL, Villarraga ML. Age and gender prevalence of revision spine fusion rates in the United States from 1990 to 2003. Poster No. 1265 presented at the 52nd Annual Meeting of ORS, Chicago, IL, March 19–22, 2006.

Mowat F. Exposure simulation for asbestos products. Presented at the 15th Annual Joint Conference of the California Industrial Hygiene Council and the American Society of Safety Engineers, San Francisco, CA, December 5–7, 2005.

Lau, E., Mowat F, Ong K, Halpern M, Kurtz S. Primary and revision hip and knee arthroplasty rates in minority populations of the United States (1990–2003). Presented at the 15th Annual Meeting of the AAHKS, Dallas, TX, November 4–6, 2005.

Lau, E., Mowat F, Ong K, Halpern M, Kurtz S. The future revision burden for hip and knee arthroplasty in the U.S.: Projections from 2005 to 2030. Presented at the 15th Annual Meeting of the AAHKS, Dallas, TX, November 4–6, 2005.

Mowat FS, Yarborough CM. Nanotoxicity: What can we learn from other small particles and fibers? Presented at the 2nd International Symposium on Nanotechnology and Occupational Health. Proceedings and Final Program, p. 69, Minneapolis, MN, October 3–6, 2005.

Tsuji JS, Mowat FS. Potential benefits and hazards of nanotechnology in water. Session on Natural Poisons and Unnatural Products. American Water Works Association Annual Conference, San Francisco, CA, June 12–16, 2005.

Sheehan P, Brorby G, Kalmes R, Mowat F, Richter R, Finley B. Characterization of the cumulative exposures of U.S. automobile brake mechanics. Presented at AIHce, Anaheim, CA, May 23–26, 2005.

Finley B, Mowat F, Richter R, Brorby G, Craven V, Sheehan P. Evaluation of proposed threshold doses for chrysotile exposure and respiratory disease. Presented at the 44th Annual Meeting of SOT, New Orleans, LA, March 6–10, 2005.

Kurtz S, Mowat F, Ong K, Chan N, Lau E, Halpern M. The revision burden for hip and knee arthroplasty in the United States. Presented at the 72nd Annual Meeting of the AAOS, Washington, DC, February 23–27, 2005.

Mowat FS, Ong KL, Chan N, Lau E, Halpern M, Kurtz SM. Economic burden of hip and knee arthroplasty procedures to the Medicare population. Presented at the 51st Annual Meeting of ORS, Washington, DC, February 20–23, 2005.

Kurtz SM, Mowat FS, Ong KL, Chan N, Lau E, Halpern M. Total hip and knee arthroplasty rates in the U.S.: Implications for a national registry. Presented at the 51st Annual Meeting of ORS, Washington, DC, February 20–23, 2005.

Finley BL, Richter RO, Mowat FS, Mlynarek S, Paustenbach DJ, Warmerdam JL, Sheehan PJ. Cumulative occupational asbestos exposures of U.S. brake repair mechanics. Abstract T6.2,

pp. 62–63. Presented at the Society of Risk Analysis Annual Meeting, Palm Springs, CA, December 5–8, 2004.

Mowat FS, Bono M, Lee RJ, Paustenbach D. Occupational exposure to airborne chrysotile asbestos during use of a historic phenolic molding compound (BMMA-5353). Abstract W2Dp-01, p. 348, presented at the 15th Annual Meeting for the International Society of Exposure Assessment, Philadelphia, PA, October 17–21, 2004.

Mowat FS, Bono M, Paustenbach D. Occupational exposure to airborne chrysotile asbestos during normal use and removal of mastics, coatings, and adhesives. Abstract W2D-02, p. 297. Presented at the 15th Annual Meeting for ISEA, Philadelphia, PA, October 17–21, 2004.

Mowat FS, Bono M, Paustenbach D. Occupational exposure to airborne chrysotile asbestos during use and removal of mastics, coating, and adhesives (circa 1940s-present day). *Toxicologist* 78(S-1):525. Presented at the 43rd Annual Meeting of SOT, Baltimore, MD, March 21–25, 2004.

Santamaria A, Li A, Mowat F, Cushing C, Finley B. Potential neurological effects of Manganese exposure during welding: a “state-of-the-science” review. *Toxicologist* 78(S-1):394. Presented at the 43rd Annual Meeting of SOT, Baltimore, MD, March 21–25, 2004.

Mowat FS, Bundy KJ. An approach to identifying contributors to toxicity and prioritizing pollutants in sediment mixtures. Abstract P247, p. 207. Presented at the 23rd Annual meeting of the Society of Environmental Toxicology and Chemistry (SETAC), Salt Lake City, UT, November 16–20, 2002.

Bundy KJ, Jacob JT, Shettlemore MG, Bi J, Mowat FS. Biosensor hydrogels based on biomolecular recognition principles. *Proceedings, Annual Conference of the Institute of Biological Engineering, Volume 3*. Eiteman M, Cuello J, Nokes S, Richard T (eds), p. 89, Baton Rouge, LA, January 18–21, 2002.

Mowat FS, McConathy BM, Kalies E, Linder G, Godsey D. Incorporating bioavailability information for metals into food-chain models. Presented at the 22nd Annual Meeting of SETAC, Baltimore, MD, November 11–15, 2001.

Bernhard TS, Pound M, Linder G, Mowat F. The derivation and application of toxicity reference values derived by the Navy and EPA Region 9 BTAG. Presented at the Northern California Chapter of SETAC, Santa Cruz, CA, June 17–19, 2001.

Bundy KJ, Shettlemore MG, Mowat FS, Jacob JT, Bi J. Technology transfer between the fields of biomaterials and environmental science. Presented at the 6th World Biomaterials Congress, Kamuela, HI, May 15–20, 2000.

Mowat FS, Bundy KJ. A novel approach for prioritizing pollutant influences in mixtures. Presented at the 4th Annual Environmental State of the State Conference, p. 36, New Orleans, LA, November 5, 1999.

Bundy KJ, Mowat FS, Shettlemore MG, Jacob JT. Feasibility of hydrogel biosensors for environmental contaminant monitoring. Abstract PMP043, p. 150. Presented at the 20th Annual Meeting of SETAC, Philadelphia, PA, November 14–18, 1999.

Mowat FS, Taverna PJ, Shettlemore MG, Bundy KJ. Monitoring sediment and aquatic toxicity under field conditions. p. 75. In: Abstract Book of the ASTM Ninth Symposium on Environmental Toxicology and Risk Assessment: Recent Achievements in Environmental Fate and Transport. Seattle, WA, April 19–21, 1999.

Mowat FS, Shettlemore MG, Bundy KJ. Toxicity assessment directly in the field. Abstract PTA228, p. 205. In: Abstract Book of the 19th Annual Meeting of SETAC, Charlotte NC, November 15–19, 1998.

Taverna PJ, Mowat FS, Bundy KJ. Environmental field assessment of Louisiana waterways. p. 36. In: Abstract Book of the 3rd Annual Environmental State of the State, Baton Rouge, LA, November 19, 1998.

Shettlemore MG, Bundy KJ, Mowat FS. Toxicity of corrosion products from orthopedic metals using a bacterial assay. Presented at the 1998 Annual Meeting of the Society for Biomaterials, San Diego, CA, April 22–26, 1998.

Bundy K, Mowat F, Taverna P, Shettlemore M. Toxicity assays and chemical analysis under field conditions. Abstract 3B/004, pp. 46. Presented at the 8th Annual Meeting of SETAC-Europe, Bordeaux, France, April 14–18, 1998.

Shettlemore M, Bundy K, Mowat F, Greene M. Bioluminescent bacterial assays of implant corrosion product toxicity. Proceedings, 16th Southern Biomedical Engineering Conference, pp. 190–193, Biloxi, MS, April 4–6, 1997.

Bundy K, Mowat F. Speciation, complexation, and sorption effects of toxicity of heavy metal mixtures in water and sediment. Abstract 152, pp. 28–29. Presented at the 17th Annual Meeting of SETAC, Washington DC, November 17–22, 1996.

Bundy K, Mowat F, Taverna P. Direct sensing of heavy metal concentrations, speciation, and toxicity in the field. Presented at the Defense Nuclear Agency Bioenvironmental Research Program, New Orleans, LA, June 6, 1996.

Bundy K, Mowat F. Speciation and toxicity studies of complex heavy metal mixtures. Proceedings, Hazardous Substance Research Consortium and Waste Management Education Research Consortium Joint Conference on the Environment. Erickson LE, et al. (eds), pp. 35–47, Albuquerque, NM, May 21–23, 1996.

Bundy K, Mowat F, Berzins D. Laboratory and field methodology for speciation studies and toxicity assessment of complex heavy metal mixtures. Presented at the DNA Bioenvironmental Research Program, New Orleans, LA, June 15, 1995.

Prior Experience

Project Manager, Mare Island Naval Shipyard and Skaggs Island, Tetra Tech EM, Inc., 2002
Deputy Installation Coordinator, Naval Base Ventura County Point Mugu, Tetra Tech EM, Inc., 2001–2002

Toxicologist/Ecological Risk Assessor, Tetra Tech EM, Inc., 2000–2002

Medical Research Technician, Tulane University Department of Pharmacology, 2000

Research Scientist/Technical Consultant, Shell Technology Ventures, Inc., 1997

Project Experience

Human Health Risk Assessment

Evaluated whether application, scraping, and sanding of asbestos-containing asphalt-based roofing products (e.g., cements and fibered coatings) had the potential to pose a health risk to workers during product removal (wet, dried, cured, and weathered material) from different roof types, tools, and clothing.

Evaluated whether application of and foreseeable interaction (cutting, sanding, and drilling) with phenolic molding compounds had the potential to pose an asbestos-related health risk to workers.

Evaluated whether application of and foreseeable interaction (cutting and removal, spill cleanup, sweep cleaning, and abrading) with coatings, mastics, and adhesives had the potential to pose an asbestos-related health risk to workers.

Managed a large project involving calculation of the emissions, air dispersion, doses, and cancer risks associated with downwind neighborhood exposures to chemicals at a rocket testing facility, including TCE, dioxin, hexavalent chromium, and hydrazines.

Reviewed potential hazards of nanotechnology in water technologies and consumer products. Researched risk assessment strategies for nano-sized metal oxides (e.g., TiO₂ and ZnO) in consumer products. Assessed the health risks of carbon nanotubes, particularly those in consumer products, and potential differences and similarities with mineral fibers, synthetic fibers, and other small particles.

Reviewed potential asbestos exposure of workers to asbestos-containing gaskets during fabrication, installation, removal (scraping and wire brushing), and replacement activities. Reviewed and analyzed data pertaining to gasket manufacturers and end users of gasket products, as well as pertinent regulatory requirements.

Evaluated lead exposures resulting from various consumer products (lead in jewelry, PVC cables, sports equipment) related to Proposition 65 issues.

Evaluated the toxicology of and exposure from non-asbestiform tremolite and tremolite fiber present in industrial talc. Reviewed epidemiologic data of talc workers and related cohorts.

Evaluated potential exposure of welder's to components of welding fumes, including manganese, iron, aluminum, mercury, and lead, and potential confounding factors related to occupational exposure of welders. Prepared a state-of-the-art analysis of manganese and manganese exposure in welders and other occupational cohorts.

Managed research issues pertaining to exposure, epidemiology, and state-of-the-art/risk assessment for nationwide cases involving asbestos in products, including brakes, gaskets, clutches, and roofing materials (coatings and cements).

Supported efforts related to evaluations exposure from asbestos in friction materials, including state-of-the-art analysis, evaluation of warning issues, analysis of the relation of the use and potential exposure to relevant regulations, study of the development of friction products over time, investigation into use of substitutes, calculation of cumulative exposures, and evaluation of alternative causation.

Evaluated literature and results of human exposure simulation studies to evaluate potential risk from ingestion, inhalation, and dermal contact with hexavalent chromium.

Epidemiology

Performed in-depth epidemiologic reviews of incidence and prevalence of rare conditions in the pediatric population resulting from various cancers to support a Pediatric Investigation Plan for a pharmaceutical.

Evaluated factors associated chemotherapy treatment decision-making in women with metastatic breast cancer and ovarian cancer patients.

Reviewed epidemiologic worker studies to evaluate the presence of a threshold for asbestosis and lung cancer from exposure to asbestos.

Gathered, analyzed, and presented information regarding epidemiologic aspects of automobile mechanics and asbestos exposure information. Published information regarding this research comparing exposures and epidemiologic studies in the United States, Europe, and Australia.

Gathered and reviewed the epidemiologic information available regarding the risk of asbestos-related disease in numerous occupations potentially exposed to asbestos (e.g., drywallers, insulators, shipyard workers, electricians).

Biomedical Engineering

Evaluated procedural counts and revision rates of total hip and knee arthroplasty in the general population and associated costs of revision surgery to the Medicare population. Analyzed the effect of gender, age, and ethnicity on arthroplasty procedures performed. Projected future revision burden and economic consequences associated with hip and knee arthroplasty through 2030.

Evaluated procedural counts and revision rates of primary total shoulder and hemi-shoulder arthroplasty, total elbow arthroplasty, and primary and revision spine fusion procedures in the United States from 1990 to 2003. Analyzed effect of age and gender on prevalence of these arthroplasty procedures.

Analyzed the caseload disparities of arthroplasty surgeons in the United States. Evaluated disparities by census region, hospital size, and hospital type for both primary and revision hip and knee arthroplasty procedures.

Ecological Risk Assessment and Environmental Science

Devised an approach to assess bioavailability of lead, nickel, and zinc in aquatic and terrestrial systems to support the development of risk-based clean up values. Developed risk-based clean-up levels for lead, mercury, and selenium in soil based on analytical results and estimates of bioavailability of these chemicals to ecological receptors.

Prepared chemical and ecological characterizations, including toxicity evaluations, interpretation of bioassay results, dose assessment, and food-chain modeling to support screening-level and baseline risk assessment.

Developed conceptual site models for exposure to metals in soil and sediment at a former naval weapons station. Developed a quantitative approach for evaluating chemicals of concern in soils and sediments at Navy installations lacking toxicity reference values.

Developed an innovative mathematical algorithm to model and evaluate contaminant interactions in Louisiana bayou sediment mixtures containing metals and PAHs. Analyzed water and tissue samples collected from the lower Mississippi River as part of a comprehensive river quality assessment.

Researched fundamental chemical and toxicological issues to assess the impact of *in situ* thermal desorption of soils contaminated by organic (furans/dioxins, pesticides) and metal (mercury, lead, arsenic) waste.

Professional Affiliations

- International Society for Pharmacoeconomics and Outcomes Research, 2011–present (member)
- National Association of Professional Women, 2007–2010 (member)
- Society of Toxicology, 2007–present (member)
- American Industrial Hygiene Association, 2005–present (member)
- Society for Risk Analysis, 2004–present (member)
- Sigma Xi, 2002–2006 (member)
- International Technology Roadmap for Semiconductors (member; Environment, Safety, and Health)