

Exponent®
Engineering & Scientific Consulting

Abby Li, Ph.D.

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Professional Profile

Dr. Li has extensive experience addressing toxicology, human health risk assessment, and other regulatory science issues for pesticides, industrial chemicals, medical devices, and pharmaceuticals. Her particular strengths include identifying and understanding key scientific issues that affect regulatory risk assessment decisions (i.e., application of uncertainty and FQPA/PCPA factors, benchmark dose, CxT analyses, and cumulative risk assessment).

Dr. Li has considerable experience in design, project management, and analysis of toxicology studies. She has expertise in the toxicity and risk assessment of neonicotinoids, organophosphates, ethylene oxide and bisphenol A.

Prior to joining Exponent Inc., Dr. Li was Senior Science Fellow at Monsanto, providing expertise in toxicology/risk assessment. She led the neurotoxicology group at Monsanto's Environmental Health Laboratory where she conducted pharmacokinetic, toxicology, and neurotoxicology studies for industrial chemicals, agricultural products, and pharmaceuticals. These studies included guideline and specialized mechanistic studies, as well as human and in vitro studies.

Dr. Li's current research interests include evaluating the neurotoxic potential of industrial and agricultural chemicals and application of quantitative risk assessment approaches and statistical methods to toxicity endpoints. Dr. Li served on the National Academy of Science's National Research Council Committee on Toxicity Testing and Assessment of Environmental Agents in the 21st century, and multiple EPA Science Advisory Boards (SAB), including recent appointments to evaluate research on hydraulic fracturing and the toxicology and risk assessment for chemicals. She has served on international and national panels on the integration of in vivo and in vitro screening methods and development of databases for prioritizing chemicals for further testing and regulatory decision-making. She has been a member of several International Life Science Institute Committees on adult and developmental neurotoxicity testing (DNT), and toxicity testing strategies for pesticides. Dr. Li served on the U.S. expert teams to the Organization for Economic Cooperation and Development (OECD) for the development of international test guidelines for adult and developmental neurotoxicity testing. She received her Ph.D. in pharmacology and physiology from the University of Chicago.

Dr. Li was President of the Neurotoxicology Specialty Section and Chair of the Specialty Section Collaboration and Communication Group of the Society of Toxicology.

Academic Credentials & Professional Honors

Ph.D., Pharmacology and Physiology, University of Chicago, 1985

B.A., Chemistry, University of Chicago, 1979

Society of Toxicologic Pathology Journal Award for Best Paper in Toxicologic Pathology 2017

Doerenkamp-Zbinden Award for distinguished service for animal protection in Science, awarded to authors of the NAS/NRC vision report, "Toxicity Testing in the 21st Century," at the 7th World Congress on alternatives to Animal Use in the Life Sciences in Rome, Italy, September 3, 2009

Monsanto Regulatory Award for Triallate Human Neurophysiology Study, 2002

Environmental and Public Affairs Excellence Award, Monsanto Agricultural Company, 1992

Achievement Award for outstanding leadership of the neurotoxicology team in developing new testing capabilities, Monsanto Agricultural Company, 1991

National Institute of Mental Health National Research Service Award, University of Chicago, Department of Pharmacology and Physiology, 1980-1985

Academic Appointments

Assistant Professor (Adjunct), St. Louis University, School of Public Health, 1994-1999

Visiting Scholar, University of Washington, Department of Environmental Health, School of Public Health and Community Medicine, Seattle, Washington, 1993

Assistant Professor (Adjunct), Department of Natural Sciences, Fontbonne College, St. Louis, Missouri, 1988-1989

Prior Experience

Senior Science Fellow/Toxicologist and Registration Manager (last position held), Monsanto, 1989-2002

Professional Affiliations

Society of Toxicology

- Chair, Specialty Section Collaboration and Communication Group, 2017
- Vice-President Elect, Vice President, President, Past President Neurotoxicology Specialty Section, 2014-2019
- Member, Scientific Program Committee, March 2010-2014

Publications

Bogen KT, Sheehan PJ, Valdez-Flores C, Li AA. Reevaluation of Historical Exposures to Ethylene Oxide Among U.S. Sterilization Workers in the National Institute of Occupational Safety and Health (NIOSH) Study Cohort. Int J Environ Res Public Health. 2019 May 16;16(10).

Li AA, Makris SL, Marty MS, Strauss V, Gilbert ME, Blacker A, Zorrilla LM, Coder PS, Hannas B, Lordi S, Schneider S. Practical considerations for developmental thyroid toxicity assessments: What's working, what's not, and how can we do better? Regul Toxicol Pharmacol. 2019 Apr 21;106:111-136.

Li AA, Sheets LP, Raffaele K, Moser V, Hofstra A, Hoberman A, Makris SL, Garman R, Bolon B, Kaufmann W, Auer R, Lau E, Vidmar T, Bowers WJ. Recommendations for harmonization of data

collection and analysis of developmental neurotoxicity endpoints in regulatory guideline studies: Proceedings of workshops presented at Society of Toxicology and joint Teratology Society and Neurobehavioral Teratology Society meetings. Neurotoxicol Teratol. 2017 Sep;63:24-45. doi: 10.1016/j.ntt.2017.07.001. Epub 2017 Jul 27.

Li AA, Garman RH, Sheets LP, Bowers WJ, Kaufmann W, Auer RN, Bolon B. Regulatory testing for developmental neurotoxicology. In: McQueen CA, Comprehensive Toxicology, Third Edition. Vol. 9, pp. 183-215, 2018. Oxford: Elsevier Ltd.\

Aschner M, Ceccatelli S, Daneshian M, Fritsche E, Hasiwa N, Hartung T, Hogberg HT, Leist M, Li A, Mundi WR, Padilla S, Persma Ah, Bal-Price A, Seiler A, Westerink R, Zimmer B, Lein P. Reference compounds for alternative test methods to indicate developmental neurotoxicity (DNT) potential of chemicals: example lists and criteria for their selection and use. ALTEX 2017. 34:49-74.

Sheets LP, Li AA, Minnema DJ, Collier RH, Creek MR, Peffer RC. A critical review of neonicotinoid insecticides for developmental neurotoxicity. Crit Rev Toxicol 2016. 46(2):153:90.

Garman RH, Li AA, Kaufmann W, Auer RN, Bolon B. Recommended methods for brain processing and quantitative analysis in rodent developmental neurotoxicity studies. Toxicol Pathol. 2016. 44:14-42.

Faber W, Kirkpatrick D, Coder P, Li A, Borghoff S, Banton M. Subchronic, reproductive, and maternal toxicity studies with tertiary butyl acetate (TBAC). Regulatory Toxicology and Pharmacology 2014; 68:332-342.

Burns CJ, McIntosh LJ, Mink PJ, Jurek AM, Li AA. Pesticide exposure and neurodevelopmental outcomes: review of the epidemiologic and animal studies. JTEH Part B 2013; 16:127-283.

Mink PJ, Kimmel CA, Li AA. Potential effects of chlorpyrifos on fetal growth outcomes: Implications for risk assessment. J Toxicol Environ Health B Crit Rev 2012;15(4):281-316.

Li, AA, Levine TE, Burns CJ, Anger WK. Integration of epidemiology and animal neurotoxicity data for risk assessment. Neurotoxicology 2012 Aug; 33(4):823-832.

Llorens J, Li A, Ceccatelli S, Sunol C. Strategies and tools for preventing neurotoxicity: to test, to predict and how to do it. Neurotoxicology 2012 Aug; 33(4):796-804.

Mink PJ, Kimmel CA, Li AA. Potential effects of chlorpyrifos on fetal growth outcomes: implications for risk assessment. JTEH Part B 2012; 15:281-316.

Bal-Price AK, Coecke S, Costa L, Crofton KM3, Fritsche E, Goldberg A, Grandjean P, Lein PL, Li A, Lucchini R, Mundy WR, Padilla S, Persico AM, Seiler AEM, Kreysa J. Advancing the Science of developmental neurotoxicity (DNT): Testing for better safety evaluation. ALTEX 2012; 29:202-215.

Li, AA, Fowles J, Banton M, Picut C, Kirkpatrick D. Acute inhalation study of allyl alcohol for derivation of acute exposure guideline levels. Inhalation Toxicology 2012; 24:213-226.

Li, AA, Lowe, KA, McIntosh, LJ, Mink, PJ. Evaluation of epidemiology and animal data for risk assessment: Chlorpyrifos developmental neurobehavioral outcomes. JTEH Part B 2012; 15:109-185.

DeSesso JM, Watson RE, Keen CL, Hazelden KP, Haws LC, Li AA. Analysis and integration of developmental neurotoxicity and ancillary data into risk assessment: A case study of dimethoate. J Toxicol Environ Health Part A 2009; 94-109.

Li AA, Baum MJ, McIntosh LJ, Day M, Liu F, Gray LE. Building a scientific framework for studying hormonal effects on behavior and on the development of the sexually dimorphic nervous system. Neurotoxicology 2008; 29:504-519.

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Krewski D (chair), Li AA (one of 22 authors). Toxicity testing in the 21st Century: A vision and a strategy. National Research Council of the National Academies. National Academies Press, Washington D.C., 2007. ISBN-13 978-0-309-10992-5. http://www.nap.edu.

Coecke S, Goldberg AM, Allen S, Buzanska L, Calamandrei G, Crofton K, Hareng L, Hartung T, Knaut H, Honegger P, Jacobs M, Lein P, Li A, Mundy W, Owen D, Schneider S, Silbergeld E, Reum T, Trnovec T, Monnet-Tschudi F, Bal-Price A. Work group report: Incorporating in vitro alternative methods for developmental neurotoxicity into international hazard and risk assessment strategies. Environ Health Perspect 2007 Jun; 115(6): 924-31.

Krewski D (chair), Li, AA (one of 22 authors). Toxicity testing for assessment of environmental agents. Committee on Toxicity Testing and Assessment of Environmental Agents. National Research Council of the National Academies. National Academies Press, Washington D.C., 2006. ISB# 0-309-10092-5. http://www.nap.edu.

Cooper RL, Lamb JC, Barlow SM, Bentley K, Brady AM, Doerrer NG, Eisenbrandt DL, Fenner-Crisp PA, Hines RN, Irvine LF, Kimmel CA, Koeter H, Li AA, Makris SL, Sheets LP, Speijers G, Whitby KE. A tiered approach to life stages testing for agricultural chemical safety assessment. Crit Rev Toxicol 2006; Jan; 36(1):69-98.

Li AA, Mink P, Mcintosh, LJ, Teta M, Finley B. Evaluation of epidemiologic and animal data associating pesticides with Parkinson's Disease. J Occup Environ Med 2005; 47(10):1059-1087.

Slikker W, Acuff K, Boyes WK, Chelonis J, Crofton KM, Dearlove GE, Li A, Moser VC, Newland C, Li Rossi J, Schantz S, Sette W, Sheets L, Stanton M, Tyl S, Sobotka TJ. Behavioral test methods workshop. Neurotoxicol Teratol 2005; 27(3):417-427.

Li AA. Regulatory developmental neurotoxicology testing: Data evaluation for risk assessment purposes. Environ Toxicol Pharmacol 2005; 19(3):727-733.

Middaugh LD, Dow-Edwards D, Li AA, Sandler JD, Seed J, Sheets LP, Shuey DL, Slikker W, Weisenburger WP, Wise LD, Selwyn M. Neurobehavioral assessment: A survey of use and value in safety assessment studies. Toxicol Sci 2003; 76(2):250-261.

Dorman DC, Allen SL, Byczkowski JZ, Claudio L, Fischer JE, Fisher JW, Harry GJ, Li AA, Makris SL, Padilla S, Sultatos LG, Mileson BE. Methods to identify and characterize developmental neurotoxicity for human health risk assessment: III. Pharmacological considerations. Environ Health Perspect 2001; 109 Suppl 1:101-111.

Moser VC, Bowen SE, Li AA, Sette WS, Weisenburger WP. Cognitive evaluation: Is it needed in neurotoxicity screening? Neurotoxicol Teratol 2000; 22:7850-798.

Li AA, Thake DC, Kaempfe TA, Branch DK, O'Donnell P, Speck FL, Tyler TR, Faber WD, Jasti SL, Ouellette R, Banton MI. Neurotoxicity evaluation of rats after subchronic inhalation exposure to Isobutanol. Neurotoxicol 1999; 20(6):889-900.

Boyes WK, Dourson ML, Patterson J, Tilson HA, Sette WF, MacPhail RC, Li A, O'Donoghue JL. EPA neurotoxicity risk assessment guidelines. Fundam Appl Toxicol 1997; 40:175-184.

Albee R, Li A, Moser V, O'Donoghue J, Ross J, and Sheets L. U.S. EPA/AIHC training video and reference manual for a functional observational battery, 1996.

Li AA. Functional assessment: From benchtop to regulator. Proceedings, The Toxicology Forum, 1994 Annual Summer Meeting, The Given Institute of Pathobiology, 1994.

Li AA. The use (misuse) of schedule-controlled operant behavior in neurotoxicity testing. In: Toxicological Interpretation of Neurobehavioral Data. Weiss B and O'Donoghue J (eds), New York, Argus, 1994.

Rees DC, Li AA. Schedule-controlled operant behavior I. Identification of neurotoxicity: Critical summary of workshop discussion and implications. In: Toxicological Interpretation of Neurobehavioral Data. Weiss B and O'Donoghue J (eds), New York, Argus, 1994.

Marek GJ, Heffner TG, Shaughnessy RA, Li AA, Seiden LS. Effects of caffeine and PD 116,600 on the differential-reinforcement-of-low-rate 72-s (DRL 72-s) schedule of reinforcement. Pharm Biochem Beh 1994.

Li AA, Asbury KJ, Hopkins WE, Feng PCC, Wilson AGE. Metabolism of alachlor by rat and monkey liver nasal turbinate tissue. Drug Metabol Disposit 1992; 20:616-618.

Li AA, Marek GJ, Hand TH, Seiden LS. Antidepressant-like effects of trazodone on a behavioral screen are mediated by trazodone, not the metabolite m-chlorophenylpiperazine. Eur J Pharm 1990; 177:137-144.

Li AA, Marek GJ, Vosmer G, Seiden LS. Long-term central 5-HT depletions resulting from repeated administration of MDMA enhances the effects of single administration of MDMA on schedule-controlled behavior of rats. Pharm Biochem Beh 1989; 33:641-648.

Marek GJ, Li AA, Seiden LS. Evidence for involvement of 5-hydroxytryptamine1 receptors in antidepressant-like drug effects on differential-reinforcement-of-low-rate 72-s behavior. J Pharmacol Exp Ther 1989; 250:60.

Marek GJ, Li A, Seiden LS. Selective 5-hydroxytryptamine2 antagonists have antidepressant-like effects on differential -reinforcement-of-low rate 72-s schedule. J Pharmacol Exp Ther 1989; 250:52-59.

Seiden LS, Marek GJ, O'Donnell JM, Li A, Dunn R, Jolly D. The role of noradrenergic and serotonergic systems in the screening of antidepressant drugs. Proceedings, 6th Club CA Symposium, Jerusalem, Israel, June 1987.

Lectures and Symposia

Li AA. Weight of evidence (WOE) and Benchmark dose (BMD) analysis: Brain morphometry and startle behavior as examples. Teratology Society Meeting, Montreal, Canada, June, 2015.

Li AA, Bowers W (Workshop Chairs). Regulatory neurodevelopmental testing: New guiding principles for harmonizing of data collection analysis. Society of Toxicology Meeting, San Diego, CA. March 24, 2015.

Li AA, Polakoff B. Analysis of EPA FQPA safety factors for 363 pesticides. Presented in session "Enhancing Strategies for Pesticide Risk Assessment," Society of Toxicology, Phoenix, AZ, March 24, 2014.

Li AA, Polakoff B. FQPA and health effects. Symposium Regulatory Risk Assessment: New Paradigms for Human Health Exposure Considerations for Dietary, Aggregate, Cumulative and FQPA, American Chemistry Society Meeting, Indianapolis, IN, September 12, 2013.

Li AA, Zeise L (Workshop Chairs). Bridging the green chemistry gap. Society of Toxicology Meeting, San Francisco, CA, 2012.

Li AA (Symposium Chair and lecturer). Integration of animal data for risk assessment. International Neurotoxicology Association Biennual Meeting, Xi'an, China, June 2011.

Li, A.A. (Lecturer) 2010. Developmental Neurotoxicity Testing: Current Approaches and Future Trends. Lecture to FDA reviewers and scientists from the Division of Food Contact Notifications (DFCN), Office of Food Additive Safety (OFAS), Center for Food Safety and Applied Nutrition. November, 2010.

Li AA (Workshop Panelist). Computational toxicology: From data to analyses to applications. National Academy of Science Emerging Science for Environmental Health Decisions, Washington D.C., September 2009. http://dels.nas.edu/envirohealth/sept_participantinfo.shtml.

Li AA, Levine T. (Session Chairs and Speakers). Pesticides and Parkinson's disease: Implications of new epidemiology and exposure data to risk assessment. Session Talk by Abby Li: Pesticide risk assessment and animal models of PD. Society of Toxicology Annual Meeting, Baltimore, MD, March 2008.

Li AA, Gray LE (Session Chairs and Speakers). Developing a framework for studying hormonal effect on sexual differentiation of the brain. International Neurotoxicology Association Meeting, Pacific Grove, CA, June 2007.

Li AA. Developmental neurotoxicology testsmart: Validation for what purpose? Center for Alternatives to Animal Testing, Reston, VA, March 2006.

Li AA. From rat to human: risk assessment for developmental neurotoxicology studies (DNT). Summer Toxicology Forum, Aspen, CO, July 2003.

Li AA, Maurissen J, Mundy W, Crofton K. Developmental neurotoxicology: data interpretation and risk assessment. International Neurotoxicology Association 9, Dresden, Germany, June 2003.

Li AA, Barnett JF, Maurissen J. Developmental neurotoxicity testing, testing and data interpretation. Invited lecturer for continuing education course on mechanisms, biomarkers, data interpretation: An integrative risk assessment using DNT as a model. Teratology Society Meeting, Scottsdale, AZ, June 2002.

Li AA. Neurotoxicology of Triallate, a thiocarbamate. International Neurotoxicology Association Meeting, Estoril, Portugal, June 2001.

Li AA. Neurotoxicology. Invited Lecturer to American Industrial Hygiene Association Toxicology Course, Redondo Beach, CA August 2000; Williamsburg, VI, August 1999.

Li AA. The value of developmental neurotoxicology testing. Winter Toxicology Forum, Washington D.C., November 1999.

Li AA. Implications of EPA's Neurotoxicity Risk Assessment Guidelines from a FIFRA Perspective. EPA's Neurotoxicity Risk Assessment Guidelines Workshop, Society of Toxicology, March 1997.

Li AA. Industry Perspective on EPA's Proposed Neurotoxicology Risk Assessment Guidelines. Summer Toxicology Forum, Aspen, Colorado, July 10, 1996.

Li AA. Session Organizer: Neurotoxicity testing: Are we on the right track? 5th International Neurotoxicity Association Meeting, Port Ludlow, WA, June 1995.

Li AA. Neurotoxicological evaluations in adult animal studies. American College of Toxicology, 15th Annual Meeting, Williamsburg, VI, October 23, 1994.

Li AA. 1994. Functional testing: from benchtop to regulator. Annual Summer Toxicology Forum, Given Institute of Pathobiology, Aspen, CO, July 12, 1994.

Li, A.A. An industrial perspective of neurotoxicity toxicity testing. University of Washington, Department of

Environmental Health School of Public Health and Community Medicine, Seattle, WA, May 19, 1994.

Li AA. FDA Redbook II: Industry's response to neurotoxicity test guidelines. Conference on the U.S. Food and Drug Administration's Redbook II, sponsored by the International Life Sciences Institute, Washington D.C., December 17, 1993.

Li AA. Neurotoxicity testing. CliniChem-93, Sponsored by the American Association for Clinical Chemistry, Albany, NY, October 15, 1993.

Li AA. Invited lecture to EPA toxicology reviewers: neurotoxicity testing: Introduction to conduct of studies and interpretation of data. Environmental Protection Agency, Crystal City, VI, April 28, 1993.

Li AA. Neurotoxicity testing. University of Washington, Department of Environmental Health School of Public Health and Community Medicine, Seattle, WA, April 8, 1993.

Li AA. Neurotoxicity screening battery. Symposium on Occupational and Environmental Neurotoxicology, Northwest Center for Occupational Health and Safety (supported by National Institute for Occupational Safety and Health), Seattle, WA, March 11, 1993.

Li AA. Neurotoxicity testing in animals. Occupational and Environmental Toxicology Symposium, sponsored by the Northwest Center for Occupational Health and Safety and University of Washington, Seattle, WA, March 11, 1993.

Li AA. The use (misuse) of schedule-controlled operant behavior in regulatory testing. 18th Rochester Conference: Toxicological Interpretation of Neurobehavioral Data, Rochester, NY, June 1992.

Li AA. Neurobehavioral testing: The good, the bad, and the ugly. Society of Toxicologic Pathologists, 11th International Symposium, Neuropathology/Neurotoxicology Workshop, Phoenix, AZ, June 5-6, 1992.

Project Experience

Science Advisor for the American Chemistry Council Ethylene Oxide Panel addressing cancer risk assessment issues resulting from publication of the EPA’s IRIS Assessment for ethylene oxide.

Conducted projects and research on industrial chemicals (including styrene, tert-butyl alcohol, allyl alcohol, isobutanol, trichloroethylene, xylene, ethylbenzene, alkanolamines, bisphenol A, manganese, nitriles); pesticides (including organophosphates (chlorpyrifos), carbamates, dithiocarbamates, neonicitinoids, pyrethroids); veterinary medicines and pharmaceuticals.

Study monitor for standard toxicity studies, adult and developmental neurotoxicity, acute inhalation studies.

Conducted projects and research on industrial chemicals (including ethylene oxide, styrene , tertbutyl alcohol, allyl alcohol trichloroethylene, xylene, ethylbenzene, alkanolamines, bisphenol A, manganese, nitriles) and pesticides (including pharmaceuticals, organophosphates, carbamates, neonicitinoids, pyrethroids).

Organized expert review and presented scientific analysis of toxicology data for agricultural and industrial chemicals to regulatory authorities or scientific advisory panels.

Evaluated use of toxicology data in quantitative analyses for carbamate and organophosphate risk assessments, both cumulative and individual, including EPA’s use of empirical dose-time response model written in “R” based on combining adult and offspring cholinesterase inhibition data from different laboratory studies.

Conducted risk assessments and derivations of reference doses (RfDs) based on a weight-of-evidence approach to evaluating toxicology databases and quantitative benchmark dose analyses of toxicology and reproduction and developmental studies.

Designed, evaluated, and monitored U.S. and international guideline adult and developmental neurotoxicology studies, with additional components added to address specific concerns relevant to different modes of action.

Designed and monitored specialized acute inhalation study specifically to improve the scientific database for derivation of AEGL values.

Provided state-of-the-science review and assessment of adult or developmental neurotoxciology literature for specific chemicals undergoing review by scientific expert panels (NTP CERHR, VCCEP expert committee).

Published literature reviews on epidemiology and animal studies on association between pesticides and Parkinson’s disease and between chlorpyrifos and developmental outcomes.

Designed and completed analysis for a study funded by competitive grant from the United Kingdom Pesticide Safety Directorate to evaluate whether human-relevant routes of exposure and dosing as a juvenile or young adult resulted in Parkinson’s disease–like pathology and behavioral effects in mice.

Primary Investigator (Study Director) and/or Technical Lead (Senior Author) for over 30 scientific reports for studies conducted according to Good Laboratory Practices to support registration of chemicals. These include EPA guideline studies, as well as more advanced mechanistic studies. Documentation of many of these reports (e.g., title, author) can be found on the National Pesticide Information Retrieval Service (NPIRS).

Advisory Appointments

Member, United States Environmental Protection Agency Science Advisory Board Chemical Assessment Advisory Committee (2013 - 2019). Provide advice through the chartered SAB regarding selected Toxicological Reviews of environmental chemicals available on EPA's Integrated Risk Information System (IRIS).

Member, Hydraulic Fracturing Research Advisory Panel (2013-2016). Provided advice and recommendations to EPA on its research on the potential environmental and human health implications of hydraulic fracturing with special emphasis on the relationship between hydraulic fracturing and drinking water resources.

Steering committee member and speaker. In vitro methods and risk assessment. 3rd international Conference on Developmental Neurotoxicity 3 (DNT3) organized by ECVAM, the European Centre for the Validation of Alternative Methods of JRC of the European Commission, Varese, Italy, May 2011.

Steering committee member and speaker. Workshop with academic researchers, study directors, product toxicologists and regulatory scientists hosted by Health Canada Pesticide Management and Regulatory Agency to provide scientific basis for standard evaluation procedures of developmental neurotoxicity studies, 2009-2012.

Workshop Panelist. Computational toxicology: From data to analyses to applications. National Academy of Science Emerging Science for Environmental Health Decisions, Washington D.C., September 2009. http://dels.nas.edu/envirohealth/sept_participantinfo.shtml.

Member, U.S. EPA's Science Advisory Board Risk and Technology Review Panel. The panel conducted

peer review of EPA's draft health and environmental assessments of industrial emissions of hazardous air pollutants, 2009.

John's Hopkins Bloomberg School of Public Health Center for Alternatives in Animal Testing DNT TestSmart 2, Steering Committee Member and Faculty. Committee member organizing workshop conference evaluating the use of high throughput in vitro methods for developmental neurotoxicity testing, 2007-2008

National Academy of Science National Research Council Committee on Toxicity Testing and Assessment of Environmental Agents. Publication of "Toxicity testing in the 21st Century: A vision and a strategy." Committee member preparing 2-volume report on using emerging science and tools (e.g. genomics, proteomics, transgenics; pharmacokinetics, mechanisms of action) into human health risk assessment.,2004-2007

ILSI Agricultural Chemical Safety Assessment Life-Stages Committee. Member of committee evaluating safety assessment testing for different life stages (fetus, infant, elderly) and developing new strategies for testing pesticides, 2002-2004

EPA Science Advisory Board Environmental Health Committee, full member for three 2-year terms. Addressed several public health and environmental issues, including indoor air, trichloroethylene, 1,3-butadiene, lead, acute reference exposure, IRIS assessments, derivation of reference concentrations, cancer risk assessment guidelines, 1996-2002

Peer consultant, EPA Benchmark Dose Peer Consultation Workshop. September 10-11, 1996

United States Expert Delegate - OECD Neurotoxicity and Developmental Neurotoxicity Expert Workgroup. Invited by EPA to serve on U.S. team of experts to develop international OECD guidelines on neurotoxicity, 1995-1998, and developmental neurotoxicity, 1996-2000

Trade Association / Scientific Leadership Appointments

Chair, American Chemistry Council Neurotoxicology Technical Panel. Scientific lead for an expert panel of industrial, government and academic neuroscientists in allocation of research dollars to advance the field of neurotoxicology, 2000-2002.

Technical Leader - American Crop Protection Agency Developmental Neurotoxicology Task Force. Led technical discussions between ACPA and EPA on design of Developmental Neurotoxicity studies, Washington DC, 2000.

Chair - American Industrial Health Council Neurotoxicology Subcommittee, Washington D.C.: Chaired subcommittee of neurotoxicology experts from industry that initiated activities to advance the state of the science related to neurotoxicology testing and risk assessment, 1993-1998.

Member, CMA Neurotoxicity Technical Task Force. Key scientist developing protocol design for schedule-controlled operant behavior and neurotoxicity studies to satisfy Multisubstance Test Rule, 1993-1995.

Editorships & Editorial Review Boards

Guest Editor, NeuroToxicology, August 2012

Editorial Board, *NeuroToxicology*, Intox Press, Inc., 1995-2002

Peer Reviews

NeuroToxicology, 2004-2005; 2008-2012