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FIELDS OF EXPERTISE:

Pharmacokinetic (PK) and Physiologically Based Pharmacokinetic (PBPK) and Pharmacodynamic (PD) Modeling; Setting Acceptable Exposure Limits; Exposure Assessment and Exposure Reconstruction; Risk Assessment; Risk Communication; Biomonitoring; Biomonitoring Equivalents; Chemical and Biomedical Engineering.

EDUCATION

PhD., Toxicology/Risk Assessment, University of Utrecht, 2009
M.S., Chemical and Biological Engineering, Colorado State University, 1997
M.S., Physiology and Biophysics, University of Vermont, 1992
B.S., Biomedical Engineering, Texas A&M University, 1989

CURRENT POSITIONS

President, Summit Toxicology, L.L.P., Allenspark, CO (2004 - present)
Assistant Clinical Professor, University of Colorado, School of Public Health, Denver, CO (2010 – present)
Affiliate Faculty, Department of Chemical and Biological Engineering, Colorado State University, Fort Collins, CO (2011 – present)

Previous Positions

Principal Scientist, Intertox, Inc., Seattle, WA (2004).
Senior Scientist, Exponent, Inc., Boulder, CO (1999 - 2003).
Scientist, ChemRisk, division of McLaren/Hart, Cleveland, OH (1995 - 1999).

ACADEMIC ACTIVITIES

Guest lecturer, University of Denver, University of Colorado, exposure assessment and risk assessment approaches, interpreting human biomonitoring data (2007 – present)

Colorado State University, Department of Chemical and Biological Engineering, lecturer in seminar series, graduate student thesis committee

BOARD & COMMITTEE ACTIVITIES

United States Environmental Protection Agency, Chemical Assessment Advisory Committee (CAAC) – 2013 - present

United States Environmental Protection Agency, Clean Air Scientific Advisory Committee (CASAC) for Lead – 2006 – present

United States Environmental Protection Agency, Chemical Assessment Advisory Committee (CAAC) – 2013 – present

Chair, Industry Advisory Board, School of Biomedical Engineering, Colorado State University (2008 – present)

Dow AgroSciences, Enlist® Scientific Advisory Committee

EDITORIAL REVIEWER/BOARDS

- Associate Editor (2008 – 2011)
 - *Journal of Exposure Analysis and Environmental Epidemiology*
- Ad Hoc Reviewer
 - *Toxicological Sciences*
 - *Journal of Toxicology and Environmental Health*
 - *Regulatory Toxicology and Pharmacology*
 - *Science of the Total Environment*
 - *Environment International*
 - *Environmental Health Perspectives*
 - *Food and Chemical Toxicology*
 - *Toxicology and Applied Pharmacology*
 - *Chemosphere*

- *International Journal of Hygiene and Environmental Health*
- *Toxicology Letters*
- *Journal of Hazardous Materials*

PROFESSIONAL MEMBERSHIPS:

- International Society of Exposure Analysis
- Society of Toxicology

PROFESSIONAL SOCIETY LEADERSHIP POSITIONS:

- Society of Toxicology, Biological Modeling Specialty Section (Vice President, 2006; President, 2007)

PROFESSIONAL MEETING AND SYMPOSIUM ORGANIZING ACTIVITIES:

- Organizing Committee. 2006. United States Environmental Protection Agency (US EPA). International Workshop on Uncertainty and Variability in Physiologically Based Pharmacokinetic [PBPK] Models. October 31 – November 2, 2006. Research Triangle Park, NC.
- Organizing Committee. 2007. Society of Toxicology, Biological Modeling Specialty Section. Roundtable on Biological/Pharmacokinetic Modeling Applications in Interpreting Biomonitoring Data. Charlotte, NC (March 2007)

EPA SCIENTIFIC ADVISORY BOARD (SAB) REVIEW PANELS

- All Ages Lead Model Review Panel (November, 2005 – 2006)
- Clean Air Scientific Advisory Committee (CASAC) review of the EPA National Ambient Air Quality Standard (NAAQS) for Lead (February 2006 – present)
- Acrylamide IRIS Assessment Review Panel (2008)

REGULATORY AND SCIENTIFIC PEER-REVIEW TESTIMONY

- Committee on Natural Resources science hearing testimony on Bill LD 1790 “An Act To Reduce Contamination of Breast Milk and the Environment from the Release of Brominated Chemicals in Consumer Products” February 12, 2004: State of Maine Legislature, Augusta, Maine. Presented findings from decabromodiphenyl ether VCCEP risk assessment.

- California Assembly Environmental Safety and Toxic Materials Committee hearing testimony on Assembly Bill 302 (Ban of polybrominated diphenyl ethers). April 22, 2003: Sacramento, CA. Presented findings from decabromodiphenyl ether VCCEP risk assessment.
- Voluntary Children's Chemical Evaluation Program (VCCEP) Peer Consultation Meeting, April 2-3, 2003: Cincinnati, OH. Defense of VCCEP Exposure and Risk Assessments for Decabromodiphenyl Ether (a brominated flame retardant).
- National Academy of Sciences (NAS) Committee "Implications of Dioxin in the Food Supply" February 2002: Washington, DC. Testified on "Dioxin body burden trends and the resulting implications for understanding current and future dietary exposures".
- Voluntary Children's Chemical Evaluation Program (VCCEP) Peer Consultation Meeting, June, 2006: Cincinnati, OH. Defense of VCCEP Benzene Risk Assessment.
- Voluntary Children's Chemical Evaluation Program (VCCEP) Peer Consultation Meeting, October, 2006: Cincinnati, OH. Defense of VCCEP Risk Assessment for Toluene.

SCIENTIFIC RESEARCH GRANT REVIEW PANELS

- USEPA STAR grant proposal review committee: Reproductive and developmental toxicology studies (2003).
- USEPA STAR grant proposal review committee: Interpretation of biomonitoring studies using biological modeling (2007).

PHARMACOKINETIC MODELING SUPPORT FOR GOVERNMENT AGENCIES

- Pharmacokinetic/physiologically based pharmacokinetic (PBPK) modeling support for ethanol risk assessment. United States Environmental Protection Agency. 2006 – 2007.
- Physiologically based pharmacokinetic (PBPK) modeling of blood lead in astronauts exposed to extended periods of micro-gravity. United States National Aeronautics and Space Administration. 2004 – 2006.

PEER-REVIEWED PUBLICATIONS:

Kirman, C.R., L.L. Aylward, M. Suh, M.A. Harris, C.M. Thompson, L.C. Haws, D.M. Proctor, S.S. Lin, W. Parker, S.M. Hays. 2013. Physiologically based pharmacokinetic model for humans orally exposed to chromium. *Chemico-Biological Int.* 204:13-27

- Aylward LL, Kirman CR, Schoeny R, Portier CJ, Hays SM. 2013. Evaluation of biomonitoring data from the CDC National Exposure Report in a risk assessment context: perspectives across chemicals. *Environ Health Perspect.* 121(3):287-94.
- Hays SM, Aylward LL, Driver J, Ross J, Kirman C. 2012. 2,4-D exposure and risk assessment: comparison of external dose and biomonitoring based approaches. *Regul Toxicol Pharmacol.* 64(3):481-9
- Kirman CR, Hays SM, Aylward LL, Suh M, Harris MA, Thompson CM, Haws LC, Proctor DM. 2012. Physiologically based pharmacokinetic model for rats and mice orally exposed to chromium. *Chem Biol Interact.* 200(1):45-64.
- Proctor DM, Suh M, Aylward LL, Kirman CR, Harris MA, Thompson CM, Gürleyük H, Gerads R, Haws LC, Hays SM. 2012. Hexavalent chromium reduction kinetics in rodent stomach contents. *Chemosphere* 89(5):487-93.
- Proctor DM, Suh M, Aylward LL, Kirman CR, Harris MA, Thompson CM, Gürleyük H, Gerads R, Haws LC, Hays SM. Hexavalent chromium reduction kinetics in rodent stomach contents. *Chemosphere.* 2012 Oct;89(5):487-93. Epub 2012 Jun 8. PubMed PMID: 22682893.
- Aylward LL, Kirman CR, Adgate JL, McKenzie LM, Hays SM. Interpreting variability in population biomonitoring data: role of elimination kinetics. *J Expo Sci Environ Epidemiol.* 2012 Jul;22(4):398-408. doi: 10.1038/jes.2012.35. Epub 2012 May 16. PubMed PMID: 22588214.
- Becker RA, Hays SM, Robison S, Aylward LL. Development of screening tools for the interpretation of chemical biomonitoring data. *J Toxicol.* 2012;2012:941082. Epub 2012 Feb 16. PubMed PMID: 22518117; PubMed Central PMCID: PMC3306934.
- Hays SM, Aylward LL. Interpreting human biomonitoring data in a public health risk context using Biomonitoring Equivalents. *Int J Hyg Environ Health.* 2012 Feb;215(2):145-8. Epub 2011 Dec 20. PubMed PMID: 22192580.
- Hays SM, Pyatt DW, Kirman CR, Aylward LL. Biomonitoring Equivalents for benzene. *Regul Toxicol Pharmacol.* 2012 Feb;62(1):62-73. Epub 2011 Dec 9. Review. PubMed PMID: 22178585.
- Boogaard PJ, Aylward LL, Hays SM. Application of human biomonitoring (HBM) of chemical exposure in the characterisation of health risks under REACH. *Int J Hyg Environ Health.* 2012 Feb;215(2):238-41. Epub 2011 Dec 15. PubMed PMID: 22177527.
- Kirman CR, Aylward LL, Blount BC, Pyatt DW, Hays SM. Evaluation of NHANES biomonitoring data for volatile organic chemicals in blood: application of chemical-specific screening criteria. *J Expo Sci Environ Epidemiol.* 2012 Jan-Feb;22(1):24-34. doi: 10.1038/jes.2011.37. Epub 2011 Oct 12. PubMed PMID: 21989501.
- Pyatt DW, Hays SM, English C, Cushing CA. United States Voluntary Children's Chemical Evaluation Program (VCCEP) risk assessment for children exposed to

benzene. *Toxicol Mech Methods*. 2012 Feb;22(2):81-104. Epub 2011 Aug 23. PubMed PMID: 21859365.

Aylward LL, Lorber M, Hays SM. Urinary DEHP metabolites and fasting time in NHANES. *J Expo Sci Environ Epidemiol*. 2011 Nov-Dec;21(6):615-24. doi: 10.1038/jes.2011.28. Epub 2011 Aug 17. PubMed PMID: 21847144.

Angerer J, Aylward LL, Hays SM, Heinzow B, Wilhelm M. Human biomonitoring assessment values: approaches and data requirements. *Int J Hyg Environ Health*. 2011 Sep;214(5):348-60. Epub 2011 Jul 20. Review. PubMed PMID: 21764371.

Aylward LL, Becker RA, Kirman CR, Hays SM. Assessment of margin of exposure based on biomarkers in blood: an exploratory analysis. *Regul Toxicol Pharmacol*. 2011 Oct;61(1):44-52. Epub 2011 Jun 15. PubMed PMID: 21703323.

Kirman CR, Aylward LL, Hays SM, Krishnan K, Nong A. Biomonitoring equivalents for DDT/DDE. *Regul Toxicol Pharmacol*. 2011 Jul;60(2):172-80. Epub 2011 Apr 3. PubMed PMID: 21466830.

Krishnan K, Adamou T, Aylward LL, Hays SM, Kirman CR, Nong A. Biomonitoring equivalents for 2,2',4,4',5-pentabromodiphenylether (PBDE-99). *Regul Toxicol Pharmacol*. 2011 Jul;60(2):165-71. Epub 2011 Apr 3. PubMed PMID: 21466829.

Hays SM, Aylward LL, Kirman CR, Krishnan K, Nong A. Biomonitoring equivalents for di-isononyl phthalate (DINP). *Regul Toxicol Pharmacol*. 2011 Jul;60(2):181-8. Epub 2011 Apr 3. PubMed PMID: 21466828.

Aylward LL, Krishnan K, Kirman CR, Nong A, Hays SM. Biomonitoring equivalents for deltamethrin. *Regul Toxicol Pharmacol*. 2011 Jul;60(2):189-99. Epub 2011 Apr 3. PubMed PMID: 21466827.

Aylward LL, Hays SM. Biomonitoring-based risk assessment for hexabromocyclododecane (HBCD). *Int J Hyg Environ Health*. 2011 Jun;214(3):179-87. Epub 2011 Mar 25. Review. PubMed PMID: 21440498.

Aylward LL, Hays SM. Consideration of dosimetry in evaluation of ToxCast™ data. *J Appl Toxicol*. 2011 Nov;31(8):741-51. doi: 10.1002/jat.1626. Epub 2011 Mar 5. PubMed PMID: 21381051.

Boogaard PJ, Hays SM, Aylward LL. Human biomonitoring as a pragmatic tool to support health risk management of chemicals--examples under the EU REACH programme. *Regul Toxicol Pharmacol*. 2011 Feb;59(1):125-32. Epub 2010 Oct 7. PubMed PMID: 20933039.

Aylward LL, Kirman CR, Blount BC, Hays SM. Chemical-specific screening criteria for interpretation of biomonitoring data for volatile organic compounds (VOCs)--application of steady-state PBPK model solutions. *Regul Toxicol Pharmacol*. 2010 Oct;58(1):33-44. Epub 2010 Jun 1. PubMed PMID: 20685286.

Aylward LL, Hays SM, Gagné M, Nong A, Krishnan K. Biomonitoring equivalents for hexachlorobenzene. *Regul Toxicol Pharmacol*. 2010 Oct;58(1):25-32. Epub 2010

Jun 12. Review. PubMed PMID: 20547196.

Hays SM, Aylward LL, Gagné M, Nong A, Krishnan K. Biomonitoring equivalents for inorganic arsenic. *Regul Toxicol Pharmacol*. 2010 Oct;58(1):1-9. Epub 2010 Jun 12. Review. PubMed PMID: 20547195.

Krishnan K, Gagné M, Nong A, Aylward LL, Hays SM. Biomonitoring Equivalents for triclosan. *Regul Toxicol Pharmacol*. 2010 Oct;58(1):10-7. Epub 2010 Jun 10. Review. PubMed PMID: 20541577.

Krishnan K, Gagné M, Nong A, Aylward LL, Hays SM. Biomonitoring Equivalents for bisphenol A (BPA). *Regul Toxicol Pharmacol*. 2010 Oct;58(1):18-24. Epub 2010 Jun 10. Review. PubMed PMID: 20541576.

Aylward LL, Morgan MK, Arbuckle TE, Barr DB, Burns CJ, Alexander BH, Hays SM. Biomonitoring data for 2,4-dichlorophenoxyacetic acid in the United States and Canada: interpretation in a public health risk assessment context using Biomonitoring Equivalents. *Environ Health Perspect*. 2010 Feb;118(2):177-81. Review. PubMed PMID: 20123603; PubMed Central PMCID: PMC2831914.

Aylward LL, Hays SM, Gagné M, Krishnan K. Derivation of Biomonitoring Equivalents for di(2-ethylhexyl)phthalate (CAS No. 117-81-7). *Regul Toxicol Pharmacol*. 2009 Dec;55(3):249-58. Epub 2009 Sep 12. PubMed PMID: 19751789.

Hays SM, Aylward LL, Gagné M, Krishnan K. Derivation of Biomonitoring Equivalents for cyfluthrin. *Regul Toxicol Pharmacol*. 2009 Dec;55(3):268-75. Epub 2009 Sep 12. PubMed PMID: 19751788.

Aylward LL, Hays SM, Gagné M, Krishnan K. Derivation of Biomonitoring Equivalents for di-n-butyl phthalate (DBP), benzylbutyl phthalate (BzBP), and diethyl phthalate (DEP). *Regul Toxicol Pharmacol*. 2009 Dec;55(3):259-67. Epub 2009 Sep 12. PubMed PMID: 19751787.

LaKind JS, Naiman DQ, Hays SM, Aylward LL, Blount BC. Public health interpretation of trihalomethane blood levels in the United States: NHANES 1999-2004. *J Expo Sci Environ Epidemiol*. 2010 May;20(3):255-62. Epub 2009 Jun 24. PubMed PMID: 19550438.

Aylward LL, Bodner KM, Collins JJ, Wilken M, McBride D, Burns CJ, Hays SM, Humphry N. TCDD exposure estimation for workers at a New Zealand 2,4,5-T manufacturing facility based on serum sampling data. *J Expo Sci Environ Epidemiol*. 2010 Jul;20(5):417-26. Epub 2009 Jun 3. PubMed PMID: 19491942.

Hays SM, Aylward LL. Using Biomonitoring Equivalents to interpret human biomonitoring data in a public health risk context. *J Appl Toxicol*. 2009 May;29(4):275-88. Review. PubMed PMID: 19115313.

LaKind JS, Hays SM, Aylward LL, Naiman DQ. Perspective on serum dioxin levels in the United States: an evaluation of the NHANES data. *J Expo Sci Environ Epidemiol*. 2009 May;19(4):435-41. Epub 2008 Oct 15. PubMed PMID: 18854873.

Aylward LL, Lakind JS, Hays SM. Derivation of biomonitoring equivalent (BE) values for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and related compounds: a screening tool for interpretation of biomonitoring data in a risk assessment context. *J Toxicol Environ Health A*. 2008;71(22):1499-508. PubMed PMID: 18836925.

Garabrant DH, Aylward LL, Berent S, Chen Q, Timchalk C, Burns CJ, Hays SM, Albers JW. Cholinesterase inhibition in chlorpyrifos workers: Characterization of biomarkers of exposure and response in relation to urinary TCPy. *J Expo Sci Environ Epidemiol*. 2009 Nov;19(7):634-42. Epub 2008 Aug 20. PubMed PMID: 18716607.

Hays SM, Aylward LL, LaKind JS, Bartels MJ, Barton HA, Boogaard PJ, Brunk C, DiZio S, Dourson M, Goldstein DA, Lipscomb J, Kilpatrick ME, Krewski D, Krishnan K, Nordberg M, Okino M, Tan YM, Viau C, Yager JW; Biomonitoring Equivalents Expert Workshop. Guidelines for the derivation of Biomonitoring Equivalents: report from the Biomonitoring Equivalents Expert Workshop. *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S4-15. Epub 2008 May 22. PubMed PMID: 18583008.

Hays SM, Aylward LL. Biomonitoring Equivalents (BE) dossier for acrylamide (AA) (CAS No. 79-06-1). *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S57-67. Epub 2008 May 22. PubMed PMID: 18583007.

Aylward LL, Barton HA, Hays SM. Biomonitoring Equivalents (BE) dossier for toluene (CAS No. 108-88-3). *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S27-36. Epub 2008 May 22. PubMed PMID: 18583006.

LaKind JS, Aylward LL, Brunk C, DiZio S, Dourson M, Goldstein DA, Kilpatrick ME, Krewski D, Bartels MJ, Barton HA, Boogaard PJ, Lipscomb J, Krishnan K, Nordberg M, Okino M, Tan YM, Viau C, Yager JW, Hays SM; Biomonitoring Equivalents Expert Workshop. Guidelines for the communication of Biomonitoring Equivalents: report from the Biomonitoring Equivalents Expert Workshop. *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S16-26. Epub 2008 May 22. PubMed PMID: 18579271.

Aylward LL, Hays SM. Biomonitoring Equivalents (BE) dossier for 2,4-dichlorophenoxyacetic acid (2,4-D) (CAS No. 94-75-7). *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S37-48. Epub 2008 May 22. PubMed PMID: 18579270.

Hays SM, Nordberg M, Yager JW, Aylward LL. Biomonitoring Equivalents (BE) dossier for cadmium (Cd) (CAS No. 7440-43-9). *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S49-56. Epub 2008 May 22. PubMed PMID: 18579269.

Aylward LL, LaKind JS, Hays SM. Biomonitoring Equivalents (BE) dossier for trihalomethanes. *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S68-77. Epub 2008 May 22. PubMed PMID: 18579267.

Hays SM, Aylward LL, Lakind JS. Introduction to the Biomonitoring Equivalents Pilot Project: development of guidelines for the derivation and communication of Biomonitoring Equivalents. *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S1-2.

Epub 2008 Mar 6. PubMed PMID: 18423822.

Nichols BR, Hentz KL, Aylward L, Hays SM, Lamb JC. Age-specific reference ranges for polychlorinated biphenyls (PCB) based on the NHANES 2001-2002 survey. *J Toxicol Environ Health A*. 2007 Nov;70(21):1873-7. PubMed PMID: 17934961.

Lakind JS, Holgate ST, Ownby DR, Mansur AH, Helms PJ, Pyatt D, Hays SM. A critical review of the use of Clara cell secretory protein (CC16) as a biomarker of acute or chronic pulmonary effects. *Biomarkers*. 2007 Sep-Oct;12(5):445-67. Review. PubMed PMID: 17701745.

Butterworth BE, Aylward LL, Hays SM. A mechanism-based cancer risk assessment for 1,4-dichlorobenzene. *Regul Toxicol Pharmacol*. 2007 Nov;49(2):138-48. Epub 2007 Jul 4. PubMed PMID: 17688981.

Pyatt DW, Aylward LL, Hays SM. Is age an independent risk factor for chemically induced acute myelogenous leukemia in children? *J Toxicol Environ Health B Crit Rev*. 2007 Sep-Oct;10(5):379-400. Review. PubMed PMID: 17687725.

Hays SM, Becker RA, Leung HW, Aylward LL, Pyatt DW. Biomonitoring equivalents: a screening approach for interpreting biomonitoring results from a public health risk perspective. *Regul Toxicol Pharmacol*. 2007 Feb;47(1):96-109. Epub 2006 Oct 6. Review. PubMed PMID: 17030369.

Hays SM, Pyatt DW. Risk assessment for children exposed to decabromodiphenyl (oxide) ether (Deca) in the United States. *Integr Environ Assess Manag*. 2006 Jan;2(1):2-12. PubMed PMID: 16640311.

Pyatt DW, Hays SM, Cushing CA. Do children have increased susceptibility for developing secondary acute myelogenous leukemia? *Chem Biol Interact*. 2005 May 30;153-154:223-9. Erratum in: *Chem Biol Interact*. 2005 Aug 15;155(3):191. PubMed PMID: 15878160.

Aylward LL, Brunet RC, Carrier G, Hays SM, Cushing CA, Needham LL, Patterson DG Jr, Gerthoux PM, Brambilla 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 Expo Anal Environ Epidemiol*. 2005 Jan;15(1):51-65. PubMed PMID: 15083163.

Hays SM, Aylward LL. Dioxin risks in perspective: past, present, and future. *Regul Toxicol Pharmacol*. 2003 Apr;37(2):202-17. Review. PubMed PMID: 12726754.

Aylward LL, Hays SM, LaKind JS, Ryan JJ. Rapid communication: partitioning of persistent lipophilic compounds, including dioxins, between human milk lipid and blood lipid: an initial assessment. *J Toxicol Environ Health A*. 2003 Jan 10;66(1):1-5. PubMed PMID: 12587287.

Aylward LL, Hays SM. Temporal trends in human TCDD body burden: decreases over three decades and implications for exposure levels. *J Expo Anal Environ Epidemiol*. 2002 Sep;12(5):319-28. PubMed PMID: 12198580.

O'Flaherty EJ, Kerger BD, Hays SM, Paustenbach DJ. A physiologically based model for the ingestion of chromium(III) and chromium(VI) by humans. *Toxicol Sci.* 2001 Apr;60(2):196-213. PubMed PMID: 11248132.

Gargas ML, Tyler TR, Sweeney LM, Corley RA, Weitz KK, Mast TJ, Paustenbach DJ, Hays SM. A toxicokinetic study of inhaled ethylene glycol ethyl ether acetate and validation of a physiologically based pharmacokinetic model for rat and human. *Toxicol Appl Pharmacol.* 2000 May 15;165(1):63-73. PubMed PMID: 10814554.

Gargas ML, Tyler TR, Sweeney LM, Corley RA, Weitz KK, Mast TJ, Paustenbach DJ, Hays SM. A toxicokinetic study of inhaled ethylene glycol monomethyl ether (2-ME) and validation of a physiologically based pharmacokinetic model for the pregnant rat and human. *Toxicol Appl Pharmacol.* 2000 May 15;165(1):53-62. PubMed PMID: 10814553.

Kirman CR, Hays SM, Kedderis GL, Gargas ML, Strother DE. Improving cancer dose-response characterization by using physiologically based pharmacokinetic modeling: an analysis of pooled data for acrylonitrile-induced brain tumors to assess cancer potency in the rat. *Risk Anal.* 2000 Feb;20(1):135-51. PubMed PMID: 10795346.

Hays SM, Elswick BA, Blumenthal GM, Welsch F, Conolly RB, Gargas ML. Development of a physiologically based pharmacokinetic model of 2-methoxyethanol and 2-methoxyacetic acid disposition in pregnant rats. *Toxicol Appl Pharmacol.* 2000 Feb 15;163(1):67-74. PubMed PMID: 10662606.

Hays SM, Aylward LL, Karch NJ, Paustenbach DJ. The relative susceptibility of animals and humans to the carcinogenic hazard posed by exposure to 2,3,7,8-TCDD: an analysis using standard and internal measures of dose. *Chemosphere.* 1997 Mar-Apr;34(5-7):1507-22. PubMed PMID: 9134683.

Verhaar HJ, Morroni JR, Reardon KF, Hays SM, Gaver DP Jr, Carpenter RL, Yang RS. A proposed approach to study the toxicology of complex mixtures of petroleum products: the integrated use of QSAR, lumping analysis and PBPK/PD modeling. *Environ Health Perspect.* 1997 Feb;105 Suppl 1:179-95. Review. PubMed PMID: 9114286; PubMed Central PMCID: PMC1470291.

Paustenbach DJ, Hays SM, Brien BA, Dodge DG, Kerger BD. Observation of steady state in blood and urine following human ingestion of hexavalent chromium in drinking water. *J Toxicol Environ Health.* 1996 Dec 6;49(5):453-61. PubMed PMID: 8968407.

Sielken RL Jr, Reitz RH, Hays SM. Using PBPK modeling and comprehensive realism methodology for the quantitative cancer risk assessment of butadiene. *Toxicology.* 1996 Oct 28;113(1-3):231-7. PubMed PMID: 8901903.

BOOK CHAPTERS:

Hays S.M. and Finley B.L. 2002. Qualitative health risk assessment of natural rubber latex in consumer products. In Paustenbach D.J. Ed. *Human and Ecological Risk Assessment: Theory and Practice*. New York: John Wiley and Sons.

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