# Weihsueh A. Chiu, PhD

**Curriculum Vitae**
**November 2016**

## CONTACT INFORMATION

Veterinary Integrative Biosciences, College of Veterinary Medicine and Biomedical Sciences
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## EDUCATION

***Princeton University, Princeton, NJ***

**Ph.D., Physics** **1998**
Dissertation: "From X-ray Clusters to Galactic Spheroids: Semi-analytic Modeling of the Origin of Structure in the Universe"

**Certificate in Science, Technology, and Environmental Policy** **1998**

**M.A., Physics** **1995**
Williams Fellow, Spring 1994

***Harvard University, Cambridge, MA***

**A.B., Physics** **1993**
*Summa cum laude* with highest honors

## PROFESSIONAL EXPERIENCE

***Professor, Department of Veterinary Integrative Biosciences, College of Veterinary Medicine and Biomedical Sciences, Texas A&M University***

***2015–present***

**Teaching**

- Fall 2015 – VIBS 689: Special Topics – Principles of Human Health Risk Assessment of Chemicals
- Fall 2016 – VIBS 689: Special Topics – Principles of Human Health Risk Assessment of Chemicals

**Research Funding**

*Ongoing Research Support*

- STAR RD-83561201, U.S. Environmental Protection Agency, Rusyn, I (PI) 06/01/14-05/31/17 Toxicogenetics of tetrachloroethylene metabolism and toxicity: Using Collaborative Cross mouse population approach to address remaining gaps in human health assessments. Role: Co-Investigator
- STAR RD-83516601, U.S. Environmental Protection Agency, Rusyn, I (PI) 07/01/12-06/30/16 Carolina Center for Computational Toxicology: Experimental and computational tools for NexGen safety assessments. Role: Co-Investigator

- P42 ES-005948, National Institute of Environmental Health Sciences, Swenberg, J (PI) 04/01/11-03/31/16. Elucidating Risks: From Exposure and Mechanism to Outcome – Project 2. Role: Co-Investigator
- STAR RD-83580201, U.S. Environmental Protection Agency, Rusyn, I (PI) 06/01/15 – 05/31/19. Cardiotoxicity Adverse Outcome Pathway Center – Project 1. Role: Co-Investigator
- T32 ES026568, National Institute of Environmental Health Sciences, Rusyn, I (PI) 04/01/2016-03/31/2021. Regulatory Science in Environmental Health and Toxicology. Role: Director, Health Assessment Track, Mentor
- U01 FD005838, Food and Drug Administration, Reisfeld, B (PI) 09/01/2016 - 08/31/2018. Enhancing the reliability, efficiency, and usability of Bayesian population PBPK modeling. Role: Co-Investigator
- U24 TR001950 National Center for Advancing Translational Sciences, Rusyn, I (PI) 09/23/16-08/31/2018. TEX-VAL: Texas A&M Tissue Chip Validation Center. Role: Co-Investigator

*Pending Research Support*

- P42 ES027704, National Institute of Environmental Health Sciences, Rusyn, I (PI) 04/01/17-03/31/22. Comprehensive tools and models for addressing exposure to mixtures during environmental emergency-related contamination events. Role: Core Principal Investigator

**Additional appointments**

- Member, Interdisciplinary Faculty of Toxicology, Texas A&M University
- Research Fellow, Institute for Science, Techology, and Public Policy, Bush School of Government and Public Service, Texas A&M University
- Member, Center for Translational Environmental Health Research (CTEHR, P30ES023512), Texas A&M University
- Director, Health Assessment Track, and Externship Coordinator, Regulatory Science in Environmental Health and Toxicology Training Program (T32 ES026568), Texas A&M University

***Supervisory Physical Scientist, National Center for Environmental Assessment (NCEA), Office of Research and Development, U.S. Environmental Protection Agency (USEPA)*** ***2012–2015***

**Chief, Toxicity Pathways Branch, Integrated Risk Information System Division** **2012–2015**

- Supervising the development of multiple human health assessments for the Integrated Risk Information System, including
  - Vanadium pentoxide
  - Inorganic arsenic
  - Hexavalent chromium
  - Naphthalene
  - Tert-butyl alcohol
  - Ethyl tert-butyl ether
- Supervising development of a physiologically-based pharmacokinetic modeling and dose-response analyses for tert-butyl alcohol and ethyl tert-butyl ether.

**Management Liaison, Toxicity Pathways and Genotoxicity Workgroup 2013–2015**

- Guiding a workgroup of 14 scientists on the identification, evaluation, application of mechanistic data (including genotoxic and non-genotoxic mechanisms) to assess human health risk of environmental chemicals, including:
  - Hexavalent chromium
  - Hexabromocyclododecane
  - Diisononyl phthalate
  - Formaldehyde
  - Libby asbestos

- Tert-butyl alcohol
- Ethyl tert-butyl ether
- Ethylene oxide
- Vanadium pentoxide

**Task Lead for multiple tasks under "Advancing and Transforming Risk Assessment Methods" Project in the Human Health Risk Assessment Research Area 2013–2015**

- ***Noncancer Economic Valuation***
  - Developed a summary report from an internal EPA workshop on economic valuation for noncancer outcomes (served as co-lead of workshop).
  - Coordinating Agency activities on noncancer economic valuation as part of a Health Benefits Workgroup.
- ***Dose-response analysis methods***

  Coordinating development of dose-response modeling and extrapolation approaches to
  - Improve model fit,
  - Better characterize uncertainty/variability,
  - Facilitate greater integration of dose-response information with exposure or economic valuation analysis.

***Environmental Health Scientist, National Center for Environmental Assessment (NCEA), U.S. Environmental Protection Agency (USEPA) 2002–2012***

**Project Area Lead for "Advancing Dose Response Analysis" in the Human Health Risk Assessment Research Area 2011–2013**

- Lead a team of 30+ scientists in the development of detailed project activities, milestones, outputs, and products.
- Coordinated tracking of schedule for milestones/deliverables.

**Chemical manager for health risk assessment of trichloroethylene 2003–present**

- Completed Toxicological Review of Trichloroethylene was posted to the IRIS website on 9/28/2011, leading a team of 15+ scientists to comprehensively review the toxicological and epidemiologic data on the health effects of trichloroethylene (TCE).
- Led development of physiologically-based pharmacokinetic (PBPK) models of mice, rats, and humans for TCE and its metabolites, integrating data from over 40 studies (comprising over 800 time-courses) using a hierarchical Bayesian population approach.
- Contributed to analyses of toxicity, carcinogenicity, and mode/mechanism-of-action for the effects of TCE in the liver, lung, and kidney.
- Developed methods for quantitative uncertainty analysis of dose-response modeling in the presence of pharmacokinetic uncertainty and variability in internal dosimetry.
- Presented TCE health risk assessment issues and results to various scientific and technical audiences, including the National Research Council (NRC) and Science Advisory Board (SAB) panels.
- Draft report released November, 2009 was favorably reviewed by the SAB.
- Continuing to provide technical assistance and advice on implementation of assessment conclusions to EPA programs and regions, and state agencies.

**Physiologically-based pharmacokinetic modeling lead for health risk assessment of tetrachloroethylene 2009–present**

- Led development of physiologically-based pharmacokinetic (PBPK) models of mice, rats, and humans for tetrachloroethylene and its metabolites, integrating data from over 25 studies (comprising over 200 time-courses) using a simplified Bayesian approach.
- Contributed to analyses of dose-response for non-cancer and cancer endpoints.
- Facilitated closure as to decisions on major scientific issues.
- Provided technical input to preparation of final Toxicological Review of Tetrachloroethylene, which was posted to the IRIS website 2/10/2012.

- Continuing to provide technical assistance and advice on implementation of assessment conclusions to EPA programs and regions, and state agencies.

**NCEA Pharmacokinetics Work Group** **2005–present**

- Inaugural co-chair of workgroup, 2005-2006.
- Led reviews of pharmacokinetics and PBPK modeling of styrene, 1,4-dioxane, and di-*n*-butyl-phthalate.
- Developed approach to use steady-state solutions for PBPK models for risk assessment applications (see Chiu and White, 2006 publication).
- Developed statistical methods for extracting information on inter-individual pharmacokinetic variability from aggregated data (see Chiu and Bois, 2007 publication).
- Using dichloromethane (methylene chloride) as a case study, investigated approaches to account for serial correlation in toxicokinetic data when calibrating PBPK models (see Klein et al. 2013 publication).

**Other Biological/Statistical Modeling Research Projects** **2002–present**

- Investigation of the *in vitro* basis for allometric scaling relationships for xenobiotic metabolism.
- Analysis of the effect of age-of-exposure in multi-stage cancer models.

**Lead/Contributor to multiple Office or Agency-wide workgroups/committees/panels**

- Co-chair of Risk Assessment Forum *Dose-Response Technical Panel,* leading a diverse panel to the develop scope and plan dose-response state-of-the-science reviews related to human variability, susceptibility, and dose-response analysis approaches. 2013-present
- Co-chair of Risk Assessment Forum *Dose-Response Matrix Technical Panel,* leading a diverse panel to develop a decision support tool for scoping and planning dose-response analyses to best meet decision-maker needs. 2011-2013
- Co-lead for Risk Assessment Colloquium Breakout Group for Unified Dose-Response and Defaults, leading a diverse breakout group to develop an action plan for responding to recent National Research Council recommendations for risk assessment 2010
- Co-chair of Risk Assessment Forum *Unified Dose Response Assessment & Defaults Technical Panel*, leading a diverse panel to development of a consensus report on responding to recent National Research Council recommendations for risk assessment 2010
- Member of Risk Assessment Forum, Human Health Oversight Committee, contributing to planning and review of projects sponsored by the Forum 2009-present
- Member of Assessment Factors Workgroup, contributing to development of the Science Policy Council document *A Summary of General Assessment Factors for Evaluating the Quality of Scientific and Technical Information* 2001-2003

***Environmental Scientist, Office of Radiation and Indoor Air (ORIA),***
***U.S. Environmental Protection Agency (USEPA)*** ***2000–2002***

**Exposure/dose assessment for radionuclides in sewage sludge and ash** **2000–2002**

- Performed statistical analyses of radioactivity sample data.
- Developed methodology for probabilistic dose modeling under various exposure scenarios.

***Analyst/Evaluator, National Security and International Affairs Division (NSIAD),***
***U.S. General Accounting Office [henceforth renamed "U.S. Governmental Accountability Office"]*** ***1998–2000***

**Evaluator-in-Charge, Review of Air Force "Ranch Hand" (Epidemiologic) Study**

- Analyzed study statistical power to detect increased cancer incidence from Agent Orange exposure.
- Formulated recommendations to improve communication and dissemination of study results.

**Team member, Review of Chemical/Biological Agent Defense Research**

- Compiled R&D funding trends and analyzed program planning documents.

## AWARDS AND HONORS

***Society of Toxicology Occupational and Public Health Specialty Section: 2013 Paper of the Year***

Zeise L, Bois FY, **Chiu WA**, Hattis D, Rusyn I, Guyton KZ. 2013. "Addressing human variability in next-generation human health risk assessments of environmental chemicals." *Environ Health Perspect.* 121(1):23-31.

***Society of Toxicology Risk Assessment Specialty Section: One of 2006's top ten papers "Advancing the Science of Risk Assessment***

**Chiu WA**, White P. 2006, "Steady-state solutions to PBPK models and their applications to risk assessment I: Route-to-route extrapolation of volatile chemicals", *Risk Analysis*, 26:3, 769-780.

***U.S. EPA Scientific and Technical Achievement Awards***

2014 Level III: "Developing an Approach and Case Study Template for Evaluating and Utilizing Toxicogenomic Data in Risk Assessment"

2010 Level III: "Research Critical to Understanding the Metabolism and Mode of Action of the Environmental Contaminant Trichloroethylene"

**Chiu WA**, Okino MS, Evans MV. 2009, "Characterizing uncertainty and population variability in the toxicokinetics of trichloroethylene and metabolites in mice, rats, and humans using an updated database, physiologically based pharmacokinetic (PBPK) model, and Bayesian approach", *Toxicol Appl Pharmacol.* 241:1, 36-60.

Evans MV, **Chiu WA**, Okino MS, Caldwell JC. 2009, "Development of an updated PBPK model for trichloroethylene and metabolites in mice, and its application to discern the role of oxidative metabolism in TCE-induced hepatomegaly", *Toxicol Appl Pharmacol.* 236:3, 329-40.

2010 Level III: "A Multidisciplinary Review of PPARalpha Activation Science Motivating an Update of Cancer Mechanisms Analysis Methods"

Guyton KZ, **Chiu WA**, Bateson TF, Jinot J, Scott CS, Brown RC, Caldwell JC. 2009, "A reexamination of the PPAR-alpha activation mode of action as a basis for assessing human cancer risks of environmental contaminants", *Environ Health Perspect.* 117:11, 1664-72.

2007 Level II: "An Update and Perspective on Some of the More Critical and Contentious Scientific Issues in the Risk Assessment of TCE"

**Chiu WA**, Caldwell JC, Keshava N, Scott CS. 2006, "Key scientific issues in the health risk assessment of trichloroethylene", *Environmental Health Perspectives*, 114:9, 1445-1449.

**Chiu WA**, Okino MS, Lipscomb JC, Evans MV. 2006, "Issues in the pharmacokinetics of trichloroethylene and its metabolites", *Environmental Health Perspectives*, 114:9, 1450-1456.

Caldwell JC, Keshava N. 2006, "Key Issues in the Modes of Action and Effects of Trichloroethylene Metabolites for Liver and Kidney Tumorigenesis", *Environmental Health Perspectives*, 114:9, 1457-1463.

Keshava N, Caldwell JC. 2006, "Key Issues in the Role of Peroxisome Proliferator–Activated Receptor Agonism and Cell Signaling in Trichloroethylene Toxicity", *Environmental Health Perspectives*, 114:9, 1464–1470.

Scott CS, **Chiu WA**. 2006, "Trichloroethylene cancer epidemiology: A consideration of select issues", *Environmental Health Perspectives*, 114:9, 1471-1478.

***U.S. EPA Gold Metal***

2012 Trichloroethylene *and Tetrachloroethylene Toxicological Review Teams*

U.S. EPA. 2011. *Toxicological review of Trichloroethylene (CASRN 79-01-6) in support of summary information on the Integrated Risk Information System (IRIS).* U.S. EPA, Washington, DC, EPA/635/R-09/011F.

U.S. EPA. 2012. *Toxicological review of Tetrachloroethylene (Perchloroethylene) (CASRN 127-18-4) in support of summary information on the Integrated Risk Information System (IRIS).* U.S. EPA, Washington, DC, EPA/635/R-08/011F.

***U.S. EPA Bronze Medals for Commendable Service***

2014 Workplan Chemicals Assessme nt Teams for TCE, DCM/NMP, ATO and HHCB

U.S. EPA. 2014. *TSCA Work Plan Chemical Risk Assessment - Trichloroethylene: Degreasing, Spot Cleaning and Arts & Crafts Uses (CASRN: 79-01-6).* U.S. EPA, Washington, DC, EPA/740-R1-4002

2014 Forging International Partnerships for Advancing EPA's Mission of Protecting Human Health and the Environment

WHO/IPCS. 2014. *Guidance Document on Evaluating and Expressing Uncertainty in Hazard Characterization.* World Health Organization, Geneva, IPCS Harmonization Project Document No. 11.

2009 Toxicogenomics in Risk Assessment DBP Case Study Group

U.S. EPA. 2009. *An Approach to Using Toxicogenomic Data in U.S. EPA Human Health Risk Assessments: A Dibutyl Phthalate Case Study.* U.S. EPA, Washington, DC, EPA/600/R-09/028F.

2005 Physiologically-based pharmacokinetic Modeling Team

U.S. EPA. 2006. *Approaches for the Application of Physiologically Based Pharmacokinetic (PBPK) Models and Supporting Data in Risk Assessment.* U.S. EPA, Washington, DC, EPA/600/R-05/043F.

2004 Trichloroethylene Risk Assessment Team

TCE Issue Paper 1: Issues in Trichloroethylene Pharmacokinetics - EPA/600/R-05/022, 2005.

TCE Issue Paper 2: Interactions of Trichloroethylene, Its Metabolites, and Other Chemical Exposures - EPA/600/R-05/023, 2005.

TCE Issue Paper 3: Role of Peroxisome Proliferator-Activated Receptor Agonism and Cell Signaling in Trichloroethylene Toxicity - EPA/600/R-05/024, 2005.

TCE Issue Paper 4: Issues in Trichloroethylene Cancer Epidemiology - EPA/600/R-05/025, 2005.

2002 Assessment Factors Workgroup:

U.S. EPA. 2003. *A Summary of General Assessment Factors for Evaluating the Quality of Scientific and Technical Information.* Science Policy Council, Washington, DC, EPA/100/B-03/001.

***U.S. EPA Monetary Awards/Promotions for Outstanding Performance of Scientific Work***

9/1/2011 - $3500 (Individual)
9/21/2010 - $3000 (Individual)
8/25/2010 - $400 (Individual)
6/3/2010 - $300 (Group)
9/8/2009 - $4000 (Group)
9/4/2008 - $3500 (Individual)
7/11/2008 - $750 (Individual)
8/22/2007 - $2000 (Individual)
11/26/2006 – Quality Step Increase
11/28/2004 – Promotion (GS-13 to GS-14)
6/16/2002 – Quality Step Increase

***U.S. EPA Time-off Awards***

2006 Recognition of Organizing and Leading the International Workshop on Uncertainty and Variability in Physiologically-based Pharmacokinetic Models

2005 Recognition of Review and Analysis of Dibutyl Phthalate Pharmacokinetics

## COMPUTER SKILLS

- Able to develop original mathematical computer models and perform original complex data and statistical analysis using C, Mathematica, IDL, FORTRAN, Microsoft Excel, MCSIM, MatLab, and R.
- Proficient with Microsoft Word, Excel, Powerpoint, Outlook, and Access; Corel Wordperfect; and Lotus Notes.

## LANGUAGES

***English:*** *mother tongue*
***French:*** *basic reading, writing, and speaking ability*
***Mandarin Chinese:*** *rudimentary speaking, reading, and writing ability*

## TEACHING/TRAINING/MENTORING

***Academic Courses taught***

**VIBS 689: Special Topics – Principles of Human Health Risk Assessment of Chemicals (Fall 2015 – 3 credit hours). Lead instructor.**

**VIBS 689: Special Topics – Practice of Human Health Risk Assessment of Chemicals (Spring 2016 – 2 credit hours). Co-lead instructor.**

**VIBS 670: Environmental Toxicology (Spring 2016 – 3 credit hours). Instructor for 1 unit.**

**VIBS 689: Special Topics – Principles of Human Health Risk Assessment of Chemicals (Fall 2016 – 3 credit hours). Lead instructor.**

***Invited lecturer/speaker***

**OECD Workshop on Socioeconomic impact assessment of chemicals management (Helsinki, Finland)**
Invited speaker: "Chemical Risk Assessment and Translation to Socio-Economic Assessments," July 2016.

**SOT 2016 Continuing Education Course (New Orleans, LA)**
**Genetics and Population Variability in Chemical Toxicity: The What, the How, and So What?:** Instructor, "Advancing Risk Assessment with Genetic and Population Variability Data," March 2016.

**Eurotox 2015 Continuing Education Course (Porto, Portugal)**
**Evaluating and Expressing Uncertainty in Hazard Characterization: New Guidance from the World Health Organization:** Invited speaker, "Deriving generic distributions from historical data for interspecies, intraspecies, and subchronic-chronic extrapolation, and how to deal with other uncertainties," and Case Study instructor, September, 2015.

**SOT FDA Colloquia on Emerging Toxicological Science Challenges in Food and Ingredient Safety (College Park, MD):**
**Contemporary Issues in Risk Assessment:** Invited speaker, "Harmonizing Dose-Response Assessment for Cancer and Non-cancer Endpoints in Human Health Assessments," June, 2015.
**Complexities in Evaluating Human Clinical and Observational Data for Ingredient Safety Assessment: Partially Hydrogenated Oils As a Case Study:** Invited speaker, "Dose-Response Assessment Approaches to the Analysis of Noncancer Health Effects: Current Practices, Advice from the National Academies, and 2014 WHO/IPCS Guidance," November, 2014.

**Public Health Risk Science and Management Course (George Washington University, Washington, DC):** Invited lecturer, "Dose-Response Assessment: Current Approaches, Key Challenges, and New Opportunities," September, 2014.

**Training Seminar on Risk Science in the 21st Century (University of Ottawa, Canada):** Invited speaker for Discussion on Risk Assessment Implications of Toxicity Testing in the 21st Century, March 2013.

**UNC ENVR 742: Theory and practice of evaluating human health risks of chemicals (University of North Carolina [UNC], Chapel Hill, NC):** Invited lecturer, "Challenges and Opportunities from National Research Council Recommendations for Risk Assessment: Review of EPA's Draft IRIS Assessment of Formaldehyde and Science and Decisions," December, 2012.

***Academic Mentoring***

**Elizabeth Barney, PhD Student at TAMU (2015-present)**

- Role: Co-chair of dissertation committee. Provide guidance on project related to risk assessment methods.

**Megan Moriarty, Masters of Public Health Student, TAMU (2015-present)**

- Role: Supervisor of Student Research Assistant. Provide guidance on project related to systematic review methods.

**Qianwen Ouyang, Masters of Biotechnology Student, TAMU (2015-present)**

- Role: Supervisor for Research Credit. Provide guidance on projected related to probabilistic dose-response assessment.

**Abhishek Venkatratnam, PhD Student at UNC (2015-present)**

- Role: Serve on dissertation committee. Provide guidance on statistical and computational methods.
- Outputs: Co-author journal article (Yoo et al., 2015).

**Jessica Wignall, Masters Student at UNC (graduated 2014)**

- Role: Guidance on application of benchmark dose modeling of toxicological data and statistical modeling of toxicity values based on chemical structure.
- Outputs: Multiple poster and oral presentations at professional meetings; one published journal article (Wignall et al., 2014); additional article in preparation.

**Andrew Shapiro, Masters Student at UNC (graduated 2014)**

- Role: Guidance on application of benchmark dose modeling and development of web-based workspace for searching, reviewing, and modeling scientific literature.
- Outputs: Multiple poster and oral presentations at professional meetings; one published journal article (Wignall et al., 2014); working web-based prototype platform for conducting human health assessments.

**Mary Kushman, Masters Student at UNC (graduated 2014)**

- Role: Guidance on developing a systematic review methodology for mechanistic data.
- Outputs: Multiple poster and oral presentations at professional meetings; one published journal article (Kushman et al., 2014).

**Hong-Sik Yoo, PhD Student at UNC**

- Role: Guidance on trichloroethylene metabolism.
- Outputs: Poster presentation at professional meeting.

**Martin Klein, PhD Student at University of Maryland at Baltimore County (graduated 2009)**

- Role: Guidance on statistical issues in physiologically-based pharmacokinetic modeling.
- Outputs: One published journal article (Klein et al., 2013).

**Tracey Woodruff, Professor at UCSF and Oak Ridge Institute for Science and Education Faculty Fellow**

- Role: Guidance on application of benchmark dose modeling of toxicological data and statistical modeling of toxicity values based on chemical structure.
- Outputs: Multiple poster and oral presentations at professional meetings; one published journal article (Wignall et al., 2014); additional article in preparation.

**Kenny Crump, Research Professor at Louisiana Technical College and Oak Ridge Institute for Science and Education Faculty Fellow**

- Role: Guidance on probabilistic and statistical dose-response issues relevant to risk assessment.
- Outputs: Three published journal articles (Chiu and Crump, 2012; Crump et al., 2010a; Crump et al., 2010b).

## PEER REVIEW EXPERIENCE

***Panel reviews***

**National Toxicology Program**

- NTP Monograph on Immunotoxicity Associated with Exposure to Perfluorooctanoic Acid (PFOA) or Perfluorooctane Sulfonate (PFOS). July, 2016. Role: Chair.

***Letter reviews***

**Food and Drug Administration**

- iRISK software. September, 2016.

**Agency for Toxic Substances and Disease Registry**

- Public Health Assessment, Camp Lejeune Drinking Water Public Health Assessment. October, 2015.

**State of California Department of Pesticide Regulation, California Environmental Protection Agency**

- 1,3- Dichloropropene Risk Characterization Document: Inhalation Exposure to Workers, Bystanders and the General Public. November, 2015.

***Academic journals***

**Associate editor:**

- Environmental Health Perspectives

**Manuscript reviewer:**

- Risk Analysis
- Environmental Health Perspectives
- Toxicological Sciences
- Regulatory Toxicology and Pharmacology
- Critical Reviews in Toxicology
- Journal of Regulatory Science

## CONFERENCES, WORKSHOPS, SYMPOSIA, and WORKGROUPS

***Organized***

**International Workshop on Uncertainty and Variability in PBPK Models, Research Triangle Park, NC** **October-November 2006**

- Chair of Organizing Committee
- Rapporteur, Breakout Group on Model Prediction
- Speaker, Plenary Session

**Symposium on Recent Scientific Research Related to the Health Effects of Trichloroethylene, Washington, DC** **February 2004**

***Representative at International Workshops or Workgroups***

- **World Health Organization/International Agency for Research on Cancer (WHO/IARC) Monograph 117:**
  - Invited Working Group member for Monograph 113 "Pentachlorophenol and related compounds," October 2016.
  - Overall Chair

- **World Health Organization/International Agency for Research on Cancer (WHO/IARC) Monograph 113:**
  - Invited Working Group member for Monograph 113 "DDT, lindane, and 2,4-D," June 2015.
  - Chair, Mechanisms Subgroup
- **World Health Organization/International Agency for Research on Cancer (WHO/IARC) Monograph 110:**
  - Invited Working Group member for Monograph 110 "Perfluoro-octanoic acid, Tetrafluoroethylene, Dichloromethane, 1,2-Dichloropropane, and 1,3-Propane sultone," June 2014.
  - Chair, Mechanisms Subgroup
- **WHO/International Program on Chemical Safety (IPCS) Project on Uncertainty in Hazard Characterization:**
  - Original project workgroup member.
  - Co-author of draft working papers, September 2010
  - Co-author of draft guidance document, November 2011
  - Co-author of revised draft guidance document, November 2013.
  - Lead author of final guidance document, September 2014.
- **WHO/IARC Monograph 106:**
  - Invited Working Group member for International Agency for Research on Cancer Monograph 106 "Trichloroethylene and other chlorinated agents," October 2012.
  - Member, Mechanisms Subgroup
- **WHO/IPCS Project on PBPK Modeling in Risk Assessment:**
  - Invited representative at Workshop on PBPK Modeling in Risk Assessment, July 2009.
  - Rapporteur for multiple breakout sessions, formulating and facilitating consensus recommendations for a variety of topics.

***Representative on National-level Committees or Workgroups***

- **National Academy of Sciences/National Research Council Committee on Development of Guiding Principles for the Inclusion of Chronic Disease Endpoints in Future Dietary Reference Intakes:**
  - Consultant, October 2016-present.
- **National Academy of Sciences/National Research Council Committee on Unraveling Low Dose Toxicity: Case Studies of Systematic Review of Evidence:**
  - Invited committee member, June 2015-present.
- **National Academy of Sciences/National Research Council Committee on Predictive-Toxicology Approaches for Military Assessments of Acute Exposures:**
  - Invited committee member, September 2014-July 2015.

***Invited Speaker/Panel Member***

**U.S. EPA Aggregate Exposure Pathway meeting.** Member of new initiative on "Aggregate Exposure Pathway" that better takes into account aggregate exposures. May 2016.

**Society of Toxicology, Occupational and Public Health Specialty Section:** Luncheon speaker. Addressing Uncertainty, Variability, Susceptibility and Risk in the 21st Century: The Union of Two NAS Reports? March 2016.

**Brown University Superfund Research Program:** Invited speaker and workgroup member for *Determining Adverse Responses Using In Vitro Assays* (title: Perspectives on "Determining Adverse Response Using In Vitro Assays"), June 2015.

**National Institute of Environmental Health Sciences:** Invited speaker for *Population-Based Rodent Resources for Environmental Health Sciences Meeting* (title: Advancing Risk Assessment with Population-Based Rodent Resources), March 2015.

**Society for Risk Analysis Annual Meeting:** Invited speaker for Symposium *Understanding and Communicating Hazard Assessment* (title: Evaluating and expressing uncertainty in hazard

characterization: a new WHO/IPCS guidance incorporating probabilistic approaches), December 2014.

**Society of Toxicology/Food and Drug Administration:** Invited speaker and panel member for Colloquium *Complexities in Evaluating Human Clinical and Observational Data for Ingredient Safety Assessment: Partially Hydrogenated Oils As a Case Study* (title: Dose-Response Assessment Approaches to the Analysis of Non-cancer Health Effects: Current Practices, Advice from the National Academies, and 2014 WHO/IPCS Guidance), November 2014.

**Society of Toxicology:** Invited presentation to Occupational and Public Health Specialty Section (title: Addressing Human Variability in Next-Generation Human Health Risk Assessments of Environmental Chemicals), October 2014.

**George Washington University:** Invited lecturer for *Public Health Risk Science and Management Course* (title: Dose-Response Assessment: Current Approaches, Key Challenges, and New Opportunities), September 2014.

**National Academy of Sciences:** Invited speaker and panel member National Research Council meeting *Emerging Science for Environmental Health Decisions: The Potential of the Tissue Chip for Environmental Health Studies* (title: Key challenges in environmental health and the risk assessment of chemicals: opportunities for tissue chips?), July 2014.

**Texas A&M University:** Invited speaker for *Toxicology Seminar Series* (title: Advancing chemical risk assessment with new experimental, computational, and conceptual approaches), May 2014.

**Society of Toxicology/FutureTox II:** Invited speaker for FutureTox II Contemporary Concepts in Toxicology Conference, *Pathways to Prediction: In Vitro Data and In Silico Models for Predictive Toxicology* (title: Opportunities and challenges in the use of *in vitro* data and *in silico* models in risk assessment of chemicals), January 2014.

**Toxicology Forum:** Invited speaker for session on The Use of Population Based Mouse Models in Toxicology (title: Opportunities and Challenges to Incorporating Genetic Variability Data in Risk Assessment), July 2013.

**Society of Toxicology:** Invited speaker for Symposium on Modeling human genetic variability and susceptibility in the laboratory (title: Opportunities and Challenges to Incorporating Genetic Variability Data in Risk Assessment), March 2013.

**U.S. EPA Inorganic Arsenic Public Stakeholder Meeting:** Co-chair of Session on Dose-Response, January 2013.

**International Conference on Environmental Health (Korea):** Invited speaker for Session on Mechanistic Basis for Risk Assessment (title: *Use of mechanistic data in risk assessment - examples from EPA's IRIS assessment of Trichloroethylene*), May-June 2012

**National Academy of Sciences:** Invited speaker for Workshop on Biological Factors that Underlie Individual Susceptibility to Environmental Stressors, and Their Implications for Decision-Making (title: *Biological Variability and Improving Environmental Decision Making*), April 2012

**Federal-State Toxicology Risk Assessment Committee Webinar:** Invited presentation on EPA's Trichloroethylene Risk Assessment (title: *Key Aspects of U.S. EPA's Toxicological Review of Trichloroethylene*), April 2012

**Toxicology Forum:** Invited co-speaker for Session on Advancing Risk Assessment Approaches in the 21st Century (title: *U.S. EPA Risk Assessment Forum Action Plan for Advancing Human Health Risk Assessment*), January 2012

**American Public Health Association Annual Meeting:** Invited panel member for Session on the Next Generation of Human Health Risk Assessment and the Protection of Public Health, November 2011

**Society for Risk Analysis Teleseminar:** Invited presentation to dose-response specialty group (title: *NexGen Risk Assessments: Challenges and Opportunities for Dose-Response Assessment*), April 2011

**Federal-State Toxicology Risk Assessment Committee Meeting:** Invited presentation (title: *Key Aspects of U.S. EPA's External Review Draft Toxicological Review of Trichloroethylene*), October 2010

**Society for Risk Analysis Annual Meeting:** Invited speaker for Symposium on Evolution of Response to the NRC (title: *Science and Decisions Recommendations for Dose-Response Assessment: Issues and Challenges*), December 2009

**Midwestern States Risk Assessment Symposium:** Invited presentation on EPA's TCE Human Health Risk Assessment (title: *Key Aspects of U.S. EPA's External Review Draft Toxicological Review of Trichloroethylene*), November 2009

**Society for Risk Analysis Teleseminar:** Invited presentation to dose-response specialty group (title: *Dose-Response Analysis in Environmental Risk Assessment: Where are we, and where are we going?*), June 2008

**National Academy of Sciences:** Invited panel member for Workshop on Mouse Liver Tumors, November 2007

**Resources for the Future:** Invited panel member for Workshop on Dealing With Simple Bioassay Data: Where Do We Go From Here? October 2007

**Society for Risk Analysis Annual Meeting:** Invited speaker for Symposium on Issues from Recent Chemical Risk Assessments of Ethylene Oxide, Perchloroethylene, and Trichloroethylene (title: *Issues in the Application of PBPK Models in Risk Assessment: Examples from Trichloroethylene and Perchloroethylene*), December 2005

**National Academy of Sciences:** Invited speaker at Committee Meetings on Key Issues in TCE Health Risks (titles: *TCE Pharmacokinetics - Recent and Ongoing PBPK Modeling Efforts* and *What are the Key Difficult Scientific Issues in the Assessment of TCE Health Risks?*), March and June 2005

**Toxicology Forum:** Invited speaker at Session on Issues in Trichloroethylene Risk Assessment (title: *Issues in Trichloroethylene Risk Assessment*), July 2003

**American Geophysical Union Spring Meeting:** Invited poster for Session on Uncertainty & Variability (title: *A Framework for Uncertainty & Parameter Estimation in Exposure Assessment*), May 2002

***Other Professional training/workshops***

- "Beyond Point Estimates: Risk Assessment Using Interval, Fuzzy and Probabilistic Arithmetic," December 2, 2001, sponsored by Society for Risk Analysis.
- "Uncertainty Assessment Methodology for Dose Assessment Modeling: Lessons Learned from Test Case Studies," October 29, 2001, sponsored by U.S. Nuclear Regulatory Commission.
- "A Comprehensive Strategy for Hydrogeological Modeling and Uncertainty Analysis for Nuclear Facilities and Sites," August 14-15, 2001, sponsored by U.S. Nuclear Regulatory Commission.
- "Ground Water Pollution and Hydrology," July 9-13, 2001 sponsored by Princeton Groundwater.
- "Advanced Methods for Dose-Response Assessment: Bayesian Approaches," September 18-20, 2000, sponsored by Resources for the Future, U.S. EPA, the Society for Risk Analysis, and the Electric Power Research Institute.

## PUBLICATIONS

***Journal Articles (peer-reviewed)***

1. Cichocki JA, Guyton KZ, Guha N, **Chiu WA**, Rusyn I, Lash LH. 2016. Target Organ Metabolism, Toxicity, and Mechanisms of Trichloroethylene and Perchloroethylene: Key Similarities, Differences, and Data Gaps. J Pharmacol Exp Ther. 2016 Aug 10. pii: jpet.116.232629
2. Cote I, Andersen ME, Ankley GT, Barone S, Birnbaum LS, Boekelheide K, Bois FY, Burgoon LD, **Chiu WA**, Crawford-Brown D, Crofton KM, DeVito M, Devlin RB, Edwards SW, Guyton KZ, Hattis D, Judson RS, Knight D, Krewski D, Lambert J, Maull EA, Mendrick D, Paoli GM, Patel CJ, Perkins EJ, Poje G, Portier CJ, Rusyn I, Schulte PA, Simeonov A, Smith MT, Thayer KA, Thomas

RS, Thomas R, Tice RR, Vandenberg JJ, Villeneuve DL, Wesselkamper S, Whelan M, Whittaker C, White R, Xia M, Yauk C, Zeise L, Zhao J, DeWoskin RS. "The Next Generation of Risk Assessment Multiyear Study- Highlights of Findings, Applications to Risk Assessment and Future Directions." Environ Health Perspect. 2016 Apr 19. E-pub ahead of print.

3. Salazar KD, Brinkerhoff CJ, Lee JS, **Chiu WA**. 2015. "Development and application of a rat PBPK model to elucidate kidney and liver effects induced by ETBE and tert-butanol," *Toxicol Appl Pharmacol*. 288(3):439-52. doi: 10.1016/j.taap.2015.08.015.
4. Yoo HS, Cichocki JA, Kim S, Venkatratnam A, Iwata Y, Kosyk O, Bodnar W, Sweet S, Knap A, Wade T, Campbell J, Clewell HJ, Melnyk SB, **Chiu WA**, Rusyn I. 2015. "The Contribution of Peroxisome Proliferator-Activated Receptor Alpha to the Relationship Between Toxicokinetics and Toxicodynamics of Trichloroethylene." *Toxicol Sci.* 147(2):339-49. doi: 10.1093/toxsci/kfv134.
5. **Chiu WA**, Slob W. 2015. "A unified probabilistic framework for dose-response assessment of human health effects." *Environ Health Perspect.* 123(12):1241. doi:10.1289/ehp.1409385.
6. Woo HD, **Chiu WA,** Jo S, Kim J. 2015. "Benchmark Dose for Urinary Cadmium based on a Marker of Renal Dysfunction: A Meta-Analysis." PLoS One. 10(5):e0126680. doi:10.1371/journal.pone.0126680.
7. Loomis D, Guyton K, Grosse Y, El Ghissasi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group, IARC, Lyon, France. 2015. "Carcinogenicity of lindane, DDT, and 2,4-dichlorophenoxyacetic acid." Lancet Oncol. 16(8):891-2. doi: 10.1016/S1470-2045(15)00081-9.
8. Abdo N, Xia M, Brown CC, Kosyk O, Huang R, Sakamuru S, Zhou YH, Jack J, Gallins P, Xia K, Li Y, **Chiu WA**, Motsinger-Reif A, Austin CP, Tice RR, Rusyn I, Wright FA. 2015. "Population-Based In Vitro Hazard and Concentration-Response Assessment of Chemicals: The 1000 Genomes High Throughput Screening Study." *Environ Health Perspect.* 123(5):458-66. doi:10.1289/ehp.1408775.
9. Lash LH, **Chiu WA,** Guyton KZ, Rusyn I. 2014. "Trichloroethylene biotransformation and its role in mutagenicity, carcinogenicity and target organ toxicity." *Mutation Research/Reviews in Mutation Research.* 762:22-36. doi:10.1016/j.mrrev.2014.04.003.
10. Krewski D, Westphal M, Andersen ME, Paoli GM, **Chiu WA**, Al-Zoughool M, Croteau MC, Burgoon LD, Cote I. 2014. "A Framework for the Next Generation of Risk Science." *Environ Health Perspect.* 122(8):796-805. doi: 10.1289/ehp.1307260.
11. Wignall JA, Shapiro AJ, Wright FA, Woodruff TJ, **Chiu WA**, Guyton KZ, Rusyn I. 2014. "Standardized Benchmark Dose Calculation: Opportunities to Inform Science-Based Decisions in Human Health Assessments." *Environ Health Perspect.* 122(5):499-505. doi: 10.1289/ehp.1307539.
12. **Chiu WA**, Campbell JL, Clewell HJ, Zhou Y-H, Wright FA, Guyton KZ, Rusyn I. 2014. "Physiologically-Based Pharmacokinetic (PBPK) Modeling of Inter-strain Variability in Trichloroethylene Metabolism in the Mouse." *Environ Health Perspect.* 122(5):456-63. doi: 10.1289/ehp.1307623.
13. Guyton KZ, Hogan K, Scott CS, Cooper G, Bale AS, Kopylev L, Barone S Jr, Makris SL, Glenn B, Subramaniam R, Gwinn MR, Dzubow RC, **Chiu WA**. 2014. "Human health effects of tetrachloroethylene: key findings and scientific issues." *Environ Health Perspect.* 122(4):325-34. doi: 10.1289/ehp.1307359.
14. Benbrahim-Tallaa L, Lauby-Secretan B, Loomis D, Guyton KZ, Grosse Y, El Ghissassi F, Bouvard V, Guha N, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group. 2014. "Carcinogenicity of perfluorooctanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone." Lancet Oncol. 15(9):924-5.
15. Rusyn I, **Chiu WA**, Lash LH, Kromhout H, Hansen J, Guyton KZ. 2014. "Trichloroethylene: Mechanistic, epidemiologic and other supporting evidence of carcinogenic hazard." *Pharmacol Ther.* 141(1):55-68. doi: 10.1016/j.pharmthera.2013.08.004.
16. Kushman ME, Kraft AD, Guyton KZ, **Chiu WA**, Makris SL, Rusyn I. 2013. "A systematic approach for identifying and presenting mechanistic evidence in human health assessments." *Regul Toxicol Pharmacol.* 67(2):266-77. doi: 10.1016/j.yrtph.2013.08.005.

17. Wilson VS, Keshava N, Hester S, Segal D, **Chiu W**, Thompson CM, Euling SY. 2013. "Utilizing toxicogenomic data to understand chemical mechanism of action in risk assessment." *Toxicol Appl Pharmacol.* 271(3):299-308.
18. **Chiu WA**, Euling SY, Scott CS, Subramaniam RP. 2013a. "Approaches to advancing quantitative human health risk assessment of environmental chemicals in the post-genomic era." *Toxicol Appl Pharmacol.* 271(3):309-23.
19. Euling SY, Thompson CM, **Chiu WA**, Benson R. 2013. "An approach for integrating toxicogenomic data in risk assessment: The dibutyl phthalate case study." *Toxicol Appl Pharmacol.* 271(3):324-35.
20. Klein M, Jeerchal N, Sinha B, **Chiu W**, White P. 2013. "Statistical inferences from serially correlated methylene chloride data." *Sankhya B,* 74(2), 211-237.
21. **Chiu WA**, Jinot J, Scott CS, Makris SL, Cooper GS, Dzubow RC, Bale AS, Evans MV, Guyton KZ, Keshava N, Lipscomb JC, Barone S Jr, Fox JF, Gwinn MR, Schaum J, Caldwell JC. 2013b. "Human health effects of trichloroethylene: key findings and scientific issues." *Environ Health Perspect.* 121(3):303-11.
22. Zeise L, Bois FY, **Chiu WA**, Hattis D, Rusyn I, Guyton KZ. 2013. "Addressing human variability in next-generation human health risk assessments of environmental chemicals." *Environ Health Perspect.* 121(1):23-31.
23. **Chiu WA**, Crump, KS. 2012. "Using Copulas to Introduce Dependence in Dose-Response Modeling of Multiple Binary Endpoints", *Journal of Agricultural Biological and Environmental Statistics*, 17:1, 107-127.
24. Guha N, Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group. 2012. "Carcinogenicity of trichloroethylene, tetrachloroethylene, some other chlorinated solvents, and their metabolites." Lancet Oncol. 13(12):1192-3.
25. **Chiu WA**. 2011, "Trichloroacetic acid: Updated estimates of its bioavailability and its contribution to trichloroethylene-induced mouse hepatomegaly", *Toxicology*, 285:114-25.
26. **Chiu WA**, Ginsberg GL. 2011, "Development and evaluation of a harmonized physiologically based pharmacokinetic (PBPK) model for perchloroethylene toxicokinetics in mice, rats, and humans", *Toxicol Appl Pharmacol.*, 253:203-34.
27. Crump KS, Chen C, **Chiu WA**, Louis TA, Portier CJ, Subramaniam RP, White PD. 2010a, "What role for biologically based dose-response models in estimating low-dose risk?", *Environ Health Perspect.* 118:5, 585-8.
28. Crump KS, **Chiu WA**, Subramaniam RP. 2010b, "Issues in using human variability distributions to estimate low-dose risk", *Environ Health Perspect.* 118:3, 387-93.
29. Guyton KZ, **Chiu WA**, Bateson TF, Jinot J, Scott CS, Brown RC, Caldwell JC. 2009, "A reexamination of the PPAR-alpha activation mode of action as a basis for assessing human cancer risks of environmental contaminants", *Environ Health Perspect.* 117:11, 1664-72.
30. **Chiu WA**, Okino MS, Evans MV. 2009, "Characterizing uncertainty and population variability in the toxicokinetics of trichloroethylene and metabolites in mice, rats, and humans using an updated database, physiologically based pharmacokinetic (PBPK) model, and Bayesian approach", *Toxicol Appl Pharmacol.* 241:1, 36-60.
31. Evans MV, **Chiu WA**, Okino MS, Caldwell JC. 2009, "Development of an updated PBPK model for trichloroethylene and metabolites in mice, and its application to discern the role of oxidative metabolism in TCE-induced hepatomegaly", *Toxicol Appl Pharmacol.* 236:3, 329-40.
32. Thompson CM, Sonawane B, Barton HA, DeWoskin RS, Lipscomb JC, Schlosser P, **Chiu WA**, Krishnan K. 2008, "Approaches for applications of physiologically based pharmacokinetic models in risk assessment", *J Toxicol Environ Health B Crit Rev.* 11:7, pp.519-47.
33. Barton HA, **Chiu WA**, Setzer RW, Andersen ME, Bailer AJ, Bois FY, Dewoskin RS, Hays S, Johanson G, Jones N, Loizou G, MacPhail RC, Portier CJ, Spendiff M, Tan YM. 2007. "Characterizing uncertainty and variability in physiologically based pharmacokinetic models: State of the science and needs for research and implementation", *Toxicological Sciences*, 99:2, 395-402.

34. **Chiu WA**, Bois FY. 2007, "An approximate method for population toxicokinetic analysis with aggregated data", *Journal of Agricultural Biological and Environmental Statistics*, 12:3, 346-363.
35. **Chiu WA**, Barton HA, Dewoskin RS, Schlosser P, Thompson CM, Sonawane B, Lipscomb JC, Krishnan K. 2007, "Evaluation of physiologically based pharmacokinetic models for use in risk assessment", *Journal of Applied Toxicology*, 27:3, 218-237.
36. **Chiu WA**, Micallef S, Monster AC, Bois FY. 2007, "Toxicokinetics of inhaled trichloroethylene and tetrachloroethylene in humans at 1 ppm: Empirical results and comparisons with previous studies", *Toxicological Sciences*, 95:1, 23-36.
37. Hack CE, **Chiu WA**, Zhao QJ, Clewell HJ. 2006, "Bayesian population analysis of a harmonized physiologically based pharmacokinetic model of trichloroethylene and its metabolites", *Regulatory Toxicology and Pharmacology*, 46:1, 63-83.
38. **Chiu WA**, Caldwell JC, Keshava N, Scott CS. 2006, "Key scientific issues in the health risk assessment of trichloroethylene", *Environmental Health Perspectives*, 114:9, 1445-1449.
39. **Chiu WA**, Okino MS, Lipscomb JC, Evans MV. 2006, "Issues in the pharmacokinetics of trichloroethylene and its metabolites", *Environmental Health Perspectives*, 114:9, 1450-1456.
40. Scott CS, **Chiu WA**. 2006, "Trichloroethylene cancer epidemiology: A consideration of select issues", *Environmental Health Perspectives*, 114:9, 1471-1478.
41. **Chiu WA**, White P. 2006, "Steady-state solutions to PBPK models and their applications to risk assessment I: Route-to-route extrapolation of volatile chemicals", *Risk Analysis*, 26:3, 769-780.
42. **Chiu WA**, Bois FY. 2006, "Revisiting the population toxicokinetics of tetrachloroethylene", *Archives of Toxicology*, 80:6, 382-385.
43. Wolbarst AB, **Chiu WA**, Yu C, Aiello K, Bachmaier JT, Bastian RK, Cheng JJ, Goodman J, Hogan R, Jones AR, Kamboj S, Lenhartt T, Ott WR, Rubin A, Salomon SN, Schmidt DW, Setlow LW. 2006, "Radioactive materials in biosolids: Dose modeling", *Health Physics*, 90:1, 16-30.
44. Bastian RK, Bachmaier JT, Schmidt DW, Salomon SN, Jones A, **Chiu WA**, Setlow LW, Wolbarst AB, Yu C, Goodman J, Lenhart T. 2005, "Radioactive materials in biosolids: National survey, dose modeling, and publicly owned treatment works (POTW) guidance", *Journal of Environmental Quality*, 34:1, 64-74.
45. **Chiu WA**, Fan XH, Ostriker JP. 2003, "Combining Wilkinson Microwave Anisotropy Probe and Sloan Digital Sky Survey quasar data on reionization constrains cosmological parameters and star formation efficiency", *Astrophysical Journal*, 599:2, 759-772.
46. **Chiu WA**, Gnedin NY, Ostriker JP. 2001, "The expected mass function for low-mass galaxies in a cold dark matter cosmology: Is there a problem?", *Astrophysical Journal*, 563:1, 21-27.
47. **Chiu WA**, Ostriker JP. 2000, "A semianalytic model for cosmological reheating and reionization due to the gravitational collapse of structure", *Astrophysical Journal*, 534:2, 507-532.
48. **Chiu WA**, Hassenzahl DM, Kammen DM. 1999, "A comparison of regulatory implications of traditional and exact two-stage dose-response models", *Risk Analysis*, 19:1, 15-22.
49. **Chiu WA**, Ostriker JP, Strauss, MA. 1998, "Using cluster abundances and peculiar velocities to test the Gaussianity of the cosmological density field", *Astrophysical Journal*, 494:2, 479-490.
50. Grady CA, Bruhweiler FC, Cheng KP, **Chiu WA**, Kondo Y. 1991, "The Circumstellar Disks of Beta-Pictoris Analogs", *Astrophysical Journal*, 367:1, 296-301.
51. Bruhweiler FC, Grady CA, **Chiu WA**. 1989, "Highly Ionized Species and Circumstellar Shells in B8-A1 Stars", *Astrophysical Journal*, 340:2, 1038-1048.

***Book Chapters***

1. Krishnan K, McPhail, B, **Chiu W,** White P. Modeling of Sensitive Subpopulations and Interindividual Variability in Pharmacokinetics for Health Risk Assessments, in *Computational Toxicology: Methods and Applications for Risk Assessment,* ed. B.A. Fowler, New York: Elsevier. 2013.

2. **Chiu WA**. Statistical Issues in Physiologically Based Pharmacokinetic Modeling, in *Toxicokinetics and Risk Assessment*, ed. J. C. Lipscomb and E. V. Ohanian, New York: Informa Healthcare, Inc. 2006.
3. **Chiu WA**, Wolbarst AB. Radiation Uses and Protection, in *Environmental Engineering and Sanitation*, 5th edition, ed. J. Salvato, N. Nemerow, and F. Agardy, New York: John Wiley & Sons, Inc. 2003.

***U.S. Government Reports***

1. U.S. EPA. 2014. *Toxicological review of Vanadium Pentoxide (V2O5) (CASRN 1314-62-1) in support of summary information on the Integrated Risk Information System (IRIS): Final Agency Review/Interagency Science Discussion draft.* U.S. EPA, Washington, DC, EPA/635/R-11/004D.
    - Supervisor, providing mentorship, direction, and training to staff scientists.
2. U.S. EPA. 2014. *Scoping and Problem Formulation for the Identification of Potential Health Hazards for the Integrated Risk Information System (IRIS) Toxicological Review of Naphthalene (CASRN 91-20-3).* U.S. EPA, Washington, DC, EPA/635/R-14/199.
    - Supervisor, providing mentorship, direction, and training to staff scientists.
3. U.S. EPA. 2014. *Preliminary Materials for the Integrated Risk Information System (IRIS) Toxicological Review of Hexavalent Chromium Part 1: Experimental Animal Studies (CASRN 18540-29-9).* U.S. EPA, Washington, DC, EPA/635/R-14/094.
    - Supervisor, providing mentorship, direction, and training to staff scientists.
4. U.S. EPA. 2014. *Draft Development Materials for the Integrated Risk Information System (IRIS) Toxicological Review of Inorganic Arsenic [CASRN 7440-38-2].* U.S. EPA, Washington, DC, EPA/635/R-14/101.
    - Supervisor, providing mentorship, direction, and training to staff scientists.
5. U.S. EPA. 2013. *Preliminary Materials for the Integrated Risk Information System (IRIS) Toxicological Review of Ethyl tert-Butyl Ether (ETBE) (CASRN 637-92-3).* U.S. EPA, Washington, DC, EPA/635/R-13/108.
    - Supervisor, providing mentorship, direction, and training to staff scientists.
6. U.S. EPA. 2013. *Preliminary Materials for the Integrated Risk Information System (IRIS) Toxicological Review of tert-Butyl Alcohol (tert-Butanol) (CASRN 75-65-0).* U.S. EPA, Washington, DC, EPA/635/R-13/107.
    - Supervisor, providing mentorship, direction, and training to staff scientists.
7. U.S. EPA. 2012. *Toxicological review of Tetrachloroethylene (Perchloroethylene) (CASRN 127-18-4) in support of summary information on the Integrated Risk Information System (IRIS).* U.S. EPA, Washington, DC, EPA/635/R-08/011F.
    - Lead scientist, toxicokinetics and physiologically-based pharmacokinetic modeling.
    - Contributing scientist, dose-response modeling.
8. U.S. EPA. 2011. *Toxicological review of Trichloroethylene (CASRN 79-01-6) in support of summary information on the Integrated Risk Information System (IRIS).* U.S. EPA, Washington, DC, EPA/635/R-09/011F.
    - Overall project lead (2003-completion).
    - Lead scientist, physiologically-based pharmacokinetic modeling.
    - Lead scientist, quantitative uncertainty analysis.
    - Contributing scientist, carcinogenicity, liver toxicity, kidney toxicity, and mode/mechanism-of-action, dose-response modeling.
9. U.S. EPA. 2009. *An Approach to Using Toxicogenomic Data in U.S. EPA Human Health Risk Assessments: A Dibutyl Phthalate Case Study.* U.S. EPA, Washington, DC, EPA/600/R-09/028F.
    - Contributing scientist, toxicokinetics.
10. U.S. EPA. 2006. *Approaches for the Application of Physiologically Based Pharmacokinetic (PBPK) Models and Supporting Data in Risk Assessment.* U.S. EPA, Washington, DC, EPA/600/R-05/043F.
    - Lead scientist, uncertainty and variability analysis.

- Lead scientist, model evaluation.

11. U.S. EPA. 2005. TCE Issue Paper 1: Issues in Trichloroethylene Pharmacokinetics. U.S. EPA, Washington, DC, EPA/600/R-05/022.
    - Team leader
    - Lead scientist.
12. U.S. EPA. 2005. TCE Issue Paper 2: Interactions of Trichloroethylene, Its Metabolites, and Other Chemical Exposures. U.S. EPA, Washington, DC, EPA/600/R-05/023.
    - Team leader.
13. U.S. EPA. 2005. TCE Issue Paper 3: Role of Peroxisome Proliferator-Activated Receptor Agonism and Cell Signaling in Trichloroethylene Toxicity. U.S. EPA, Washington, DC, EPA/600/R-05/024.
    - Team leader.
14. U.S. EPA. 2005. TCE Issue Paper 4: Issues in Trichloroethylene Cancer Epidemiology. U.S. EPA, Washington, DC, EPA/600/R-05/025.
    - Team leader.
15. U.S. EPA. 2003. *A Summary of General Assessment Factors for Evaluating the Quality of Scientific and Technical Information*. Science Policy Council, Washington, DC, EPA/100/B-03/001.
    - Contributing scientist.
16. Interagency Steering Committee on Radiation Standards. 2005. *Assessment of Radioactivity in Sewage Sludge: Recommendations on Management of Radioactive Materials in Sewage Sludge and Ash at Publicly Owned Treatment Works.* U.S. Department of Energy, Washington DC, DOE/EH-0668; EPA 832-R-03-002B.
    - Lead scientist, uncertainty analysis.
    - Contributing scientist, dose-modeling.
17. Interagency Steering Committee on Radiation Standards. 2004. *Assessment of Radioactivity in Sewage Sludge: Modeling to Assess Radiation Doses.* Nuclear Regulatory Commission, Washington DC, NUREG-1783; EPA 832-R-03-002A; DOE/EH-0670EPA-832/R-03/002A.
    - Lead scientist, uncertainty analysis.
    - Contributing scientist, dose-modeling.

***International Agency Publications and Reports***

1. Loomis D, Guyton K, Grosse Y, El Ghissasi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group. 2015. Carcinogenicity of lindane, DDT, and 2,4-dichlorophenoxyacetic acid. Lancet Oncol. 16(8):891-2. doi: 10.1016/S1470-2045(15)00081-9.
    - Member of Working Group.
    - Chair of subgroup on Mechanisms of Carcinogenicity.
2. WHO/IPCS. 2014. Guidance Document on Evaluating and Expressing Uncertainty in Hazard Characterization. World Health Organization, Geneva, IPCS Harmonization Project Document No. 11.
    - Lead author.
3. Benbrahim-Tallaa L, Lauby-Secretan B, Loomis D, Guyton KZ, Grosse Y, El Ghissassi F, Bouvard V, Guha N, Mattock H, Straif K, on behalf of the International Agency for Research on Cancer Monograph Working Group. 2014. Carcinogenicity of perfluorooctanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone. The Lancet Oncology, 15(9): 924-925. DOI: 10.1016/S1470-2045(14)70316-X
    - Member of Working Group.
    - Chair of subgroup on Mechanisms of Carcinogenicity.
4. WHO/IARC. 2014. Trichloroethylene, Tetrachloroethylene, and Some Other Chlorinated Agents. IARC Monogr Eval Carcinog Risk Chem Hum, 106: 1-514.
    - Member of Working Group.

5. Guha N, Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Baan R, Mattock H, Straif K, on behalf of the International Agency for Research on Cancer Monograph Working Group. 2012. Carcinogenicity of trichloroethylene, tetrachloroethylene, some other chlorinated solvents, and their metabolites. The Lancet Oncology, 13(12): 1192-1193. DOI: 10.1016/S1470-2045(12)70485-0
    - Member of Working Group.
6. WHO/IPCS. 2010. Characterization and application of physiologically based pharmacokinetic models in risk assessment. World Health Organization, Geneva, IPCS Harmonization Project Document No. 9.
    - Workshop participant.

***Other Published Articles (e.g., non-peer-reviewed letters)***

1. **Chiu WA**; Chen C; Hogan K; Lipscomb JC; Scott CS; Subramaniam R, 2007, "High-to-low dose extrapolation: Issues and approaches," *Human and Ecological Risk Assessment,* 13:1, 46-51.
2. **Chiu WA**, White P. 2006, "Steady-state solutions to PBPK models and their applications to risk assessment I: Route-to-route extrapolation of volatile chemicals - Authors' response to letter by Dr. Kenneth Bogen", *Risk Analysis*, 26:6, 1417-1418.
3. Cox LA, **Chiu WA**, Kammen DM. 2000, "Low dose responses - Response", *Risk Analysis*, 20:3, 298-299.
4. Caldwell JC, Evans MV, Marcus AH, Scott CS, **Chiu WA**, Okino MS, Preuss PW. 2006, "Comments on article "Applying mode-of-action and pharmacokinetic considerations in contemporary cancer risk assessments: An example with trichloroethylene" by Clewell and Andersen", *Critical Reviews in Toxicology*, 36:3, 291-294.

***Other Abstracts, Posters, and Presentations (representative examples)***

**Chiu WA**. 2016. Probabilistic dose-response assessment: Basic principles and general approach developed by the WHO/IPCS. Society of Toxicology meeting, March 2016.

Rusyn I, **Chiu WA**, Guyton KZ, Martin M, Reif D. 2016. Use of high throughput screening data in International Agency for Research on Cancer (IARC) monograph evaluations. Society of Toxicology meeting, March 2016.

Cichocki JA, Furuya S, Chappell G, Venkatratnam A, Sweet S, Wade T, Knap A, McDonald T, **Chiu WA**, Threadgill D, Rusyn I. 2016. Inter-individual variability in the relationship between toxicokinetics and toxicodynamics of tetrachloroethylene. Society of Toxicology meeting, March 2016.

Venkatrtnam A, Furuya S, Kosyl O., Soldatow V, Sweet S, Wade T, Knap A, Gold A, Bodnar W, **Chiu WA**, Rusyn I. Using the Collaborative Cross mouse model to investigate population-level variability in trichloroethylene toxicity. Society of Toxicology meeting, March 2016.

Herzler M, **Chiu WA**, Slob W. 2016. New WHO Guidance on Uncertainty in Hazard Characterization: A Unified Tiered Approach Integrating Deterministic and Probabilistic Methods. German Pharm-Tox Summit (3/1-3/2/2016).

**Chiu WA.** 2015. Probabilistic dose-response assessment: Basic principles and general approach developed by the WHO/IPCS. Society for Risk Analysis Annual Meeting.

**Chiu WA.** 2015. Practical integration of old and new evidence streams with a harmonized dose-response assessment tool developed by WHO/IPCS. Society for Risk Analysis Annual Meeting.

**Chiu WA.** 2015. Evaluating and Expressing Uncertainty in Dose-Response Assessment: A New WHO/IPCS Guidance Incorporating Probabilistic Approaches. Society of Toxicology Annual Meeting.

Salazar K, Lee J, **Chiu WA**, Brinkerhoff C. 2015. Application of a rat PBPK model to elucidate kidney effects induced by ETBE and tert-butanol. Society of Toxicology Annual Meeting.

Cichocki J, Yoo HS, Benkatratunam A, **Chiu WA**, Rusyn I, Kim S, Kosyk O, Bodnar W, Sweet S, Wade T, Knapp A, Campbell J, Clewell H, Melnyk S. 2015. The Role of Peroxisome Proliferator-Activated Receptor-Alpha in the Relationship between Trichloroethylene toxicokinetics and toxicodynamics. Society of Toxicology Annual Meeting.

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