2012 Toxicology and Risk Assessment Conference
Biochemical Interactions: From Molecules to Man

Archived Program Book

April 30 – May 3, 2012
The Wingate by Wyndham
West Chester, Ohio

Conference Co-Chairs:
David R. Mattie, PhD, DABT
The United States Air Force

Anu Mudipalli, MS, PhD
The United States Environmental Protection Agency

Sudha P. Pandalai, MD, PhD
The Centers for Disease and Control, the National Institute for Occupational Safety and Health

Meeting Manager:
Lindsey Lampert
Professional and Scientific Associates (PSA), Inc.
## General Information

| Conference Title       | 2012 Toxicology and Risk Assessment Conference  
|                        | Biochemical Interactions: From Molecules to Man |
| Sponsors               | National Institute for Occupational Safety and Health; U.S. Army Public Health Command; Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine; U.S. Environmental Protection Agency, National Center for Environmental Assessment; 711th Human Performance Wing, Air Force Research Laboratory |
| Conference Site        | The Wingate by Wyndham Meridian Conference Center  
|                        | 7500 Tylers Place Blvd  
|                        | West Chester, Ohio |
| Conference Dates       | April 30-May 3, 2012 |
2012 Steering Committee Members

David R. Mattie, Steering Committee Co-chair, US Air Force
Anu Mudipalli, Steering Committee Co-chair, US Environmental Protection Agency
Sudha P. Pandalai, Steering Committee Co-chair, National Institute of Occupational Safety and Health,
Ambuja Bale, US Environmental Protection Agency
William Eck, US Army
Richard Erickson, US Navy
Michael Gargas, US Navy
G. Jean Harry, National Institutes of Health, National Institute of Environmental Health Sciences
John Hinz, US Air Force
Gabriel Intano, US Army
Andrew Kraft, US Environmental Protection Agency
Lana D. Harvey, US Air Force
Sherri Hutchens, US Army
Lindsey Lampert, Conference Coordinator, Professional and Scientific Associates
John Lipscomb, US Environmental Protection Agency
Barb MacKenzie, National Institute for Occupational Safety and Health
Kathleen MacMahon, National Institute for Occupational Safety and Health
Karen Mumy, US Navy
Srikanth S. Nadadur, National Institutes of Health, National Institute of Environmental Health Sciences
Geoffrey Patton, US Food and Drug Administration
Meg Poehlmann, Toxicology Excellence for Risk Assessment
Gunda Reddy, US Army
Shirley Robertson, National Institute for Occupational Safety and Health
Laurie Roszell, US Army
Deborah L. Sammons, National Institute of Occupational Safety and Health
Russell E. Savage, ICF, International
John E. Snawder, National Institute for Occupational Safety and Health
Christine Sofge, National Institute for Occupational Safety and Health
Cynthia Striley, National Institute for Occupational Safety and Health
Kevin Ulmes, US Army
John Wheeler, Agency for Toxic Substance and Disease Registry
Conference Overview

Monday, April 30, 2012:  Registration 12:30 pm – 5:00 pm
Monday, April 30, 2012:  Workshops 1:00 pm – 5:00 pm

W-1. Workshop: Physiologically Based Pharmacokinetic Models in Risk Assessment
W-3. Workshop: Crash Course in Human Health Risk Assessment of Environmental Chemicals

Tuesday, May 1, 2012:  Morning Session 8:30 am – 11:45 am

Opening Remarks
1A. Plenary Session - Hydraulic Fracturing

Tuesday, May 1, 2012:  Afternoon Session 1:00 pm – 5:00 pm

2A. Using in vitro Models to Predict Outcomes from Human Exposure
2B. Occupational Epidemiology – Current Updates

Tuesday, May 1, 2012:  Evening Session 5:45 pm – 7:45 pm

Poster Session

Wednesday, May 2, 2012:  Morning Sessions 8:30 am – 11:45 am

3A. Metal-based Engineered Nanomaterials: Our Current Understanding on Potential Health Implications
3B. Correlating in vitro Data to in vivo Findings for Risk Assessment
3C. Physiologically-Based Pharmacokinetic Modeling

Wednesday, May 2, 2012:  Afternoon Sessions 1:00 pm – 5:00 pm

4A. Factors Contributing to Variability: Conundrums in Occupational Risk Assessment
4B. Biological Toxicants
4C. Occupational Epidemiology - Study Design and Data Issues for Risk Assessment

Thursday, May 3, 2012: Workshops 8:30 am – 12:00 pm

W-4. Workshop: Cumulative Risk Assessment
W-6. Workshop: Chemical-Specific Adjustment Factors
W-7. Workshop: Exposure-Response Arrays and Other Modes for Visualizing Toxicological Data for Risk Assessment

Thursday, May 3, 2012: Workshops 1:00 pm – 5:00 pm

W-4. Workshop: Cumulative Risk Assessment (continued)
2012 Toxicology and Risk Assessment Conference
Biochemical Interactions: From Molecules to Man

April 30- May 03, 2012

Conference Co-chairs:
David R. Mattie, PhD, DABT, US Air Force, Wright Patterson Air Force Base, OH
Anu Mudipalli, MS, PhD, US Environmental Protection Agency, Research Triangle Park, NC
Sudha Pandalai, MD, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

Monday, April 30, 2012 1:00 pm – 5:00 pm

12:30 pm – 5:00 pm Registration
1:00 pm – 5:00 pm Workshops (Separate registration required)

W-1 Physiologically Based Pharmacokinetic Models in Risk Assessment

W-2 Fundamentals in Cancer Risk Assessment - An Introduction to Underlying Biology and Basic Quantitative Risk Assessment Methods

W-3 Crash Course in Human Health Risk Assessment of Environmental Chemicals

3:00 pm – 3:30 pm Break

Workshops

1:00 pm W-1. Physiologically Based Pharmacokinetic Models in Risk Assessment *
Workshop Leader: Lisa Sweeney, PhD, DABT, CHMM, US Air Force, Wright Patterson Air Force Base, OH

Workshop Speakers:
- Michael Gargas, PhD, US Navy, Wright Patterson Air Force Base, OH
- Lisa Sweeney, PhD, DABT, CHMM, US Air Force, Wright Patterson Air Force Base, OH
- John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH

1:00 pm W-2. Fundamentals in Cancer Risk Assessment - An Introduction to Underlying Biology and Basic Quantitative Risk Assessment Methods*
Workshop Leaders:
Anu Mudipalli, PhD, US Environmental Protection Agency, Research Triangle Park, NC
Jay Zhao, PhD, US Environmental Protection Agency, Cincinnati, OH

Workshop Speakers:
- Anu Mudipalli, PhD, US Environmental Protection Agency, Research Triangle Park, NC
- David E. Malarkey DVM, PhD, DACVP, National Institutes of Health, National Institutes of Environmental Health Sciences, Research Triangle Park, NC
- Lynne Haber, PhD, DABT, Toxicology Excellence for Risk Assessment, Cincinnati, OH
- Jason Lambert, PhD, US Environmental Protection Agency, Cincinnati, OH
- Jay Zhao, PhD, US Environmental Protection Agency, Cincinnati, OH

1:00 pm  W-3. Crash Course in Human Health Risk Assessment of Environmental Chemicals*
Workshop Leader: Glenn Rice, ScD, US Environmental Protection Agency, Cincinnati, OH

Workshop Speakers:
- Glenn Rice, ScD, US Environmental Protection Agency, Cincinnati, OH
- John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH
- Scott Wesselkamper, PhD, US Environmental Protection Agency, Cincinnati, OH
- Amanda M. Evans, MSPH, Association of Schools of Public Health
- Bernard Gadagbui, PhD, DABT, ERT, Toxicology Excellence for Risk Assessment, Cincinnati, OH

Tuesday, May 1, 2012  8:30 am – 11:45 am

MORNING SESSION

8:30 am – 8:45 am  Welcome and Conference Opening Remarks
Conference Co-chairs:

David R. Mattie, PhD, DABT, US Air Force, Wright Patterson Air Force Base, OH
Anu Mudipalli, MS, PhD, United States Environmental Protection Agency, Research Triangle Park, NC
Sudha P. Pandalai, MD, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

8:45 am – 11:45 am  Plenary Session – Hydraulic Fracturing

09:50 am – 10:10 am  Break

Plenary Session  1A. Hydraulic Fracturing
Co-chairs:
John E. Snawder, PhD, DABT, National Institute for Occupational Safety and Health, Cincinnati, OH
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH
8:45 am  **Oil and gas production 101**  
John E. Snawder, PhD, DABT, National Institute for Occupational Safety and Health, Cincinnati, OH

9:15 am  **Progress Update: EPA’s Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources**  
Tentative

9:45 am  **Break**

10:15 am  **NIOSH Exposure Assessment Upstream Oil and Gas Worker Research**  
Michael Breitenstein, BS, National Institute for Occupational Safety and Health, Cincinnati, OH

10:45 am  **Evaluation of Environmental and Community Health Issues Association with Oil and Gas Production**  
Mark D. Johnson, MSPH, PhD, DABT, Agency for Toxic Substances and Disease Registry, Chicago, IL

11:15 am  **Question/ Answer/ Panel Discussion**  
Session co-chairs and speakers

11:45 am – 1:00 pm  **Lunch**

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**Tuesday, May 1, 2012**  
**1:00 pm – 5:00 pm**

**AFTERNOON SESSION**

1:00 pm – 5:00 pm  
2A - Using *in vitro* Models to Predict Outcomes from Human Exposure  
2B - Occupational Epidemiology – Current Updates

2:45 pm – 3:15 pm  **Break**

2A.  **Using *in vitro* Models to Predict Outcomes from Human Exposure**  
Co-chairs:  
G. Jean Harry, PhD, National Institutes of Health, National Institute of Environmental Health Sciences, Research Triangle Park, NC  
Andrew Kraft, PhD, US Environmental Protection Agency, Washington, DC

1:00 pm  **Introduction and Opening Remarks**  
Andrew Kraft, PhD, US Environmental Protection Agency, Washington, DC

1:15 pm  **Understanding Developmental Toxicity *in vitro***  
Ying Xia, PhD, University of Cincinnati, Cincinnati, OH

2:00 pm  **Influence of the Neurogenic Niche on Neuroprogenitor Cells in the Brain: Comparison of an In Vivo and In Vitro Model of Neurotoxicant Exposure.**
2:45 pm  Break

3:15 pm  Dermal and Lung In Vitro Models to Evaluate Potential Occupational Effects of Military Fuels
Karen Mumy, PhD, US Navy, Wright Patterson Air Force Base, OH

4:00 pm  Utilizing the Power of Human Genome Variation for Population Scale in vitro Testing
Ivan Rusyn, MD, PhD, University of North Carolina, Chapel Hill, NC

4:45 pm  Closing Remarks, Comments, and Outstanding Questions
Session co-chairs and speakers

2B. Occupational Epidemiology – Current Updates
Co-chairs:
Sudha P. Pandalai, MD, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH
Kevin Ulmes, BCE, US Army, Aberdeen Proving Grounds, MD

1:00 pm  Reproductive Effects of Working Night and Rotating Shifts
Christina Lawson, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

1:35 pm  ABLES – Trends in Lead Exposure and Surveillance in the US
Walter Alarcon, MD, MSc, National Institute for Occupational Safety and Health, Cincinnati, OH

2:10 pm  Mortality among 24,865 Workers Exposed to Polychlorinated Biphenyls (PCBs) in Three Electrical Capacitor Manufacturing Plants: A Ten-Year Update
Avima Ruder, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

2:45 pm  Break

3:15 pm  Occupational Exposure to Arthropod-borne Diseases in the Military. A Case Study
Will K. Reeves, PhD, US Air Force, Wright Patterson Air Force Base, OH

3:35 pm  Surveillance of Hearing Levels in USAF Hazardous Noise Environments
Laurel Lloyd, MPH, Contractor US Air Force, Dayton, OH
Eric Koenig, MA, CCC-A, MacAulay-Brown, Dayton, OH

3:55 pm  Cadmium and Lung Cancer Mortality Accounting for Simultaneous Arsenic Exposure
Robert Park, MS, National Institute for Occupational Safety and Health, Cincinnati, OH

4:25 pm  Question/Answer/Panel Discussion
Session co-chairs and speakers

Tuesday, May 1, 2012  5:45 pm – 7:45 pm
EVENING SESSION

5:45 pm – 7:45 pm  Poster Session

Poster Session
Co-chairs:
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH
Sudha Pandalai, MD, PhD, National Institute of Occupational Safety and Health, Cincinnati, OH

Wednesday, May 2, 2012  8:30 am – 11:45 am

MORNING SESSION

8:30 am – 11:45 am  3A - Metal-based Engineered Nanomaterials: Our Current Understanding on Potential Health Implications

3B - Correlating in vitro Data to in vivo Findings for Risk Assessment

3C - Physiologically-Based Pharmacokinetic Modeling

9:50 am – 10:10 am  Break

3A. Metal-based Engineered Nanomaterials: Our Current Understanding on Potential Health Implications
Co-chairs:
Anu Mudipalli, MS, PhD, United States Environmental Protection Agency, Research Triangle Park, NC
Srikanth S. Nadadur, PhD, National Institutes of Health, National Institute of Environmental Health Sciences, Research Triangle Park, NC

8:30 am  Environmental Health and Safety of Engineered Nanomaterials: Issues, Research Needs and Approaches
Srikanth S. Nadadur, PhD, National Institutes of Health, National Institute of Environmental Health Sciences, Research Triangle Park, NC

8:45 am  Dose Rate-related Effects in the Respiratory Tract of Metal Oxide Nanoparticles: Considerations for Dosimetry and Hazard Assessment
Alison Elder, PhD, University of Rochester, Rochester, NY

9:15 am  Using Systems Genetics/Genomics to Inform the Design and Manufacture of Safer Quantum Dots
Terrance J. Kavanagh, PhD, DABT, University of Washington, Seattle, WA

9:50 am  Break

10:10 am  Cadmium Associated with Inhaled Nanoparticles Alters Reproductive and Developmental Outcomes in a Pregnant Mouse Model
Judith T. Zelikoff, PhD, New York University, Tuxedo, NY
10:45 am  A Dosimetry Driven Framework for Metal Oxide Nanoparticles Hazard Ranking and Risk Assessment Can We Translate Fundamental Science into Risk Assessment?  
Justin Teeguarden, PhD, Pacific Northwest National Laboratory, Richland, WA

11:20 am  Question/ Answer/ Panel Discussion
Session co-chairs and speakers

3B. Correlating in vitro Data to in vivo Findings for Risk Assessment
Co-chairs:
Ambuja Bale, PhD, US Environmental Protection Agency, Washington, DC
Geoffrey Patton/, PhD, US Food and Drug Administration, Washington, DC

8:30 am  Opening Remarks
Ambuja Bale, PhD, US Environmental Protection Agency, Washington, DC

8:45 am  New Approaches to Toxicology
Donna Mendrick, PhD, US Food and Drug Administration, Jefferson, AR

9:15 am  Mapping the Human Toxome
Thomas Hartung, MD, PhD, Johns Hopkins University, Baltimore MD

9:50 am  Break

10:10 am  In vitro to in vivo Extrapolation for Application in Physiologically Based Pharmacokinetic Modeling
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH

10:45 am  Building “Reality” into In Vitro Hepatotoxicity Assays
Thomas Flynn, PhD, US Food and Drug Administration, Laurel, MD

11:20 am  Question/ Answer/ Panel Discussion
Session co-chairs and speakers

3C. Physiologically-Based Pharmacokinetic Modeling
Co-chairs:
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH
David R. Mattie, PhD, DABT, US Air Force, Wright Patterson Air Force Base, OH

8:30 am  Physiologically Based Pharmacokinetic Modeling – the Preferred Approach to Dosimetric Adjustment
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH

9:05 am  Use of a Human Bisphenol A (BPA) PBPK Model to Evaluate Internal Dosimetry
Jeff Fisher, MS, PhD, Fellow ATS, US Food and Drug Administration, Jefferson, AR

9:40 am  Application of Dioxin Physiologically-based Pharmacokinetic (PBPK) Models to Risk Assessment
Hisham El-Masri, PhD, US Environmental Protection Agency, Research Triangle Park, NC
10:15 am  Break

10:45 am  Using PBPK and PK Models to Derive Biomonitoring Equivalents and Interpret Human Biomonitoring Data  
Sean Hays, MS, PhD, Summit Toxicology, LLP, Allenspark, CO

11:20 am  Question/ Answer/ Panel Discussion  
Session co-chairs and speakers

11:45 am – 1:00 pm  Lunch

Wednesday, May 2, 2012  1:00 pm – 5:00 pm

AFTERNOON SESSION

1:00 pm -1:15 pm  General Remarks  
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH

1:15 pm – 5:00 pm  4A - Factors Contributing to Variability: Conundrums in Occupational Risk Assessment

4B - Biological Toxicants

4C - Occupational Epidemiology - Study Design and Data Acquisition Issues

2:45 pm – 3:15 pm  Break

4A. Factors Contributing to Variability: Conundrums in Occupational Risk Assessment
Co-chairs:
Laurie Roszell, PhD, DABT, US Army Public Health Command, Aberdeen Proving Grounds, MD
Christine Sofge, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

1:15 pm  Temporal Patterns and Task Based Approaches  
Andy Maier, MS, PhD, DABT, CIH, Toxicology Excellence for Risk Assessment, Cincinnati, OH

1:45 pm  Addressing Human Variability in a Cumulative Risk Paradigm  
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH

2:15 pm  Military Exposure Guidelines  
Kevin Ulmes, BCE, US Army, Aberdeen Proving Grounds, MD

2:45 pm  Break
3:15 pm  **Cumulative Risk for Occupational Settings**  
TJ Lentz, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

3:45 pm  **Risk to Male Reproductive Health: It is More than Sperm Count!**  
Steve Schrader, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

4:15 pm  **Question/ Answer/ Panel Discussion**  
Session co-chairs and speakers

### 4B. Biological Toxicants

**Co-chairs:**  
Gabriel Intano, PhD, US Army Public Health Command, Aberdeen Proving Grounds, MD  
Kathleen MacMahon, DVM, MS, National Institute for Occupational Safety and Health, Cincinnati, OH

1:15 pm  **Biological Toxicants and Toxins**  
Gabriel Intano, PhD, US Army Public Health Command, Aberdeen Proving Grounds, MD

1:45 pm  **Public Health Aspects of Bioterrorism Events**  
Marie De Perio, MD, National Institute for Occupational Safety and Health, Cincinnati, OH

2:15 pm  **NIOSH Anthrax Preparedness Activities**  
Lisa Delaney, CIH, National Institute for Occupational Safety and Health, Atlanta, GA

2:45 pm  **Break**

3:15 pm  **Dual Use Research of Concern**  
Gayle DeBord, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

3:45 pm  **Site-Specific Risk Assessment to Inform Risk-based Clean-up Goals for Anthrax**  
Tonya Nichols, PhD, US Environmental Protection Agency, Washington, DC

4:15 pm  **Detecting the Determinants of Virulence to Identify Pathogens of Interest**  
James Baldwin, PhD, US Air Force, Wright Patterson Air force Base, OH

### 4C. Occupational Epidemiology - Study Design and Data Issues for Risk Assessment

**Co-Chairs:**  
Sudha P. Pandalai, MD, PhD, National Institute of Occupational Safety and Health, Cincinnati, OH  
John Hinz, MS, US Air Force, Wright Patterson Air Force Base, OH

1:15 pm  **Industrywide Studies among U.S. Carbon Nanotube- and Nanofiber-Exposed Workers: Challenges and Opportunities**  
Mary Schubauer-Berigan, MS, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

1:45 pm  **Using Statistical Simulations to Evaluate Study Designs**  
Misty Hein, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH
2:15 pm  Exposure Assessment Issues in Radiation Workers  
Tim Taulbee, PhD, National Institute for Occupational Safety and Health, Cincinnati, OH

2:45 pm  Break

3:15 pm  Operation Tomodachi  
David Sonntag, PhD, MSPH, US Air Force, Wright Patterson Air Force Base, OH

3:45 pm  A priori Study Design for Risk Assessment of Hexavalent Chromium  
Donald Goodwin, PhD, US Air Force, Wright Patterson Air Force Base, OH

4:15 pm  Question/ Answer/ Panel Discussion  
Session co-chairs and speakers

Thursday, May 3, 2012  
8:30 am – 5:00 pm

Workshops / Discussions Session  
*(Separate registration required)

8:30 am – 12:00 pm

W-4  Cumulative Risk Assessment: Grouping and Analyzing Combined Chemical, Biological, Physical and Socio-Economic Stressors

W-5  Benchmark Dose Modeling: Theory and Application of Basic Modeling Methodologies in Risk Assessment

W-6  Chemical-Specific Adjustment Factors: Application of Data to Reduce Uncertainty in Inter- and Intraspecies Extrapolation for Chemical Risk Assessment

W-7  Exposure-Response Arrays and Other Modes for Visualizing Toxicological Data for Risk Assessment

1:00 pm – 5:00 pm

W-4  Cumulative Risk Assessment: Grouping and Analyzing Combined Chemical, Biological, Physical and Socio-Economic Stressors (continued)

W-8  Benchmark Dose Modeling: Advanced Methodologies and Tools for Performing more Complex Dose Response Analyses

10:00 am – 10:30 am  Break
12:00 pm – 1:00 pm  Lunch

3:00 pm – 3:30 pm   Break

Workshops

8:30 am -1 2:00

W-4.  Cumulative Risk Assessment: Grouping and Analyzing Combined Chemical, Biological, Physical and Socio-Economic Stressors*
Workshop Leader:  Linda K. Teuschler, MS, US Environmental Protection Agency, Cincinnati, OH

Presenters:
- Linda K. Teuschler, MS, US Environmental Protection Agency, Cincinnati, OH
- Richard C. Hertzberg, PhD, Biomathematics Consulting, Atlanta, GA
- Glenn E. Rice, ScD, US Environmental Protection Agency, Cincinnati, OH
- Moiz Mumtaz, PhD, Agency for Toxic Substances and Disease Registry, Atlanta, GA
- Jane Ellen Simmons, MSPH, PhD, DABT, US Environmental Protection Agency, Research Triangle Park, NC
- J Michael Wright, ScD, US Environmental Protection Agency, Cincinnati, OH

8:30 am - 12:00

W-5.  Benchmark Dose Modeling: Theory and Application of Basic Modeling Methodologies in Risk Assessment*
Workshop Leaders:
Allen Davis, MSPH, US Environmental Protection Agency, Research Triangle Park, NC
Jeff Gift, PhD, US Environmental Protection Agency, Research Triangle Park, NC
Andy Shapiro, BSPH, ICF International, Durham, NC

Workshop Speakers:
- Allen Davis, MSPH, US Environmental Protection Agency/Research Triangle Park, NC
- Andy Shapiro, MS, ICF International, Durham, NC
- Jeff Gift, PhD, US Environmental Protection Agency, Research Triangle Park, NC
- Jay Zhao, MPH, PhD, DABT, US Environmental Protection Agency, Cincinnati, OH

8:30 am -12:00

W-6.  Chemical-Specific Adjustment Factors: Application of Data to Reduce Uncertainty in Inter- and Intraspecies Extrapolation for Chemical Risk Assessment*
Workshop Leader:  John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH

Workshop Speakers:
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH
Lynne Haber, PhB, DABT, Toxicology Excellence for Risk Assessment, Cincinnati, OH

8:30 am - 12:00

W-7.  Exposure-Response Arrays and Other Modes for Visualizing Toxicological Data for Risk Assessment *
Workshop Leader:  George Woodall, PhD, MSEH, US Environmental Protection Agency, Research Triangle Park, NC
W-4. Cumulative Risk Assessment: Grouping and Analyzing Combined Chemical, Biological, Physical and Socio-Economic Stressors (continued)*
Workshop Leader: Linda K. Teuschler, MS, US Environmental Protection Agency, Cincinnati, OH

Presenters:
- Linda K. Teuschler, MS, US Environmental Protection Agency, Cincinnati, OH
- Richard C. Hertzberg, PhD, Biomathematics Consulting, Atlanta, GA
- Glenn E. Rice, ScD, US Environmental Protection Agency, Cincinnati, OH
- Moiz Mumtaz, PhD, Agency for Toxic Substances and Disease Registry, Atlanta, GA
- Jane Ellen Simmons, MSPH, PhD, DABT, US Environmental Protection Agency, Research Triangle Park, NC
- J Michael Wright, ScD, US Environmental Protection Agency, Cincinnati, OH

1:00 pm – 5:00 pm
W-8. Benchmark dose modeling: Advanced methodologies and tools for performing more complex dose response analyses *
Workshop Leaders:
Allen Davis, MSPH, US Environmental Protection Agency, Research Triangle Park, NC
Jeff Gift, PhD, US Environmental Protection Agency, Research Triangle Park, NC
Andy Shapiro, MS, ICF International, Durham, NC

Workshop Speakers:
- Allen Davis, MSPH, US Environmental Protection Agency, Research Triangle Park, NC
- Andy Shapiro, BSPH, ICF International, Durham, NC
- Jeff Gift, PhD, US Environmental Protection Agency, Research Triangle Park, NC
- Jay Zhao, MPH, PhD, DABT, US Environmental Protection Agency, Cincinnati, OH
Continuing Education Information

Please enquire at the registration desk for materials related to continuing education.

PREREQUISITES:

Target audience should have previous basic knowledge of occupational/environmental medicine, occupational/environmental safety and health, occupational/environmental epidemiology, general toxicology, occupational/environmental toxicology, occupational/environmental safety and health risk assessment, risk assessment, pharmacology, and/or veterinary medicine.

FORMAT: These seminars are live events.

PROGRAM DESCRIPTION:

The purpose of the Toxicology and Risk Assessment Conference is to provide attendees with an overview of current research, methodologic, and practice issues that are the focus of toxicology research and risk assessment efforts in various Federal agencies, academic institutions, industries, and other organizations. Presentations will address the professional practice gap between actual and ideal (or intended) knowledge, competency, skills, strategies, and performance based on toxicology and risk assessment issues. Addressing this PPG in this conference will enable clinicians to improve patient outcomes and take greater leadership roles in daily contact with patients, workers, employers, industry, and other occupational medicine practitioners when considering problems related to toxicology and risk assessment.

OBJECTIVES:

At the conclusion of the session, the participant will be able to accomplish the following:

1. Describe what quantitative risk assessment informs and the steps involved.
2. Describe some issues related to toxicology and risk assessment in the context of occupational, environmental, and military considerations.
3. Describe some hazards found in the occupational, environmental, and/or military setting that are the focus of toxicological research and risk assessment efforts and discuss issues related to hazard recognition and evaluation.
4. Describe some epidemiologic and biostatistical issues related to toxicology and risk assessment for selected hazards.
5. Describe some issues in exposure assessment and/or dose-response modeling in the occupational, environmental, and/or military setting that are relevant to toxicology and risk assessment for selected hazards.
6. Describe issues in quantitative risk assessment that have implications for clinical occupational and environmental medicine for selected hazards.
7. Describe some issues in occupational and environmental medicine (OEM) related law and regulations in the occupational, environmental, and/or military setting that are relevant to toxicology and risk assessment.
8. Describe some clinical implications of the science underlying toxicology and risk assessment issues for hazards in occupational, environmental, and/or military situations.
9. List some competencies/skills/strategies relevant to the clinical management of exposure to hazards, as well as hazard control, in occupational, environmental, and/or military situations.
10. Discuss OEM related management and administration issues for selected hazards.

CONTACT INFORMATION: Office of Sudha P. Pandalai (513) 533-8220
The 2012 Toxicology and Risk Assessment Conference Continuing Education Accreditation Statement:

CME: This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the Centers for Disease Control & Prevention and The U.S. Environmental Protection Agency. The Centers for Disease Control and Prevention is accredited by the Accreditation Council for Continuing Medical Education (ACCME®) to provide continuing medical education for physicians.

The Centers for Disease Control and Prevention designates this live educational activity for a maximum of 22.5 AMA PRA Category 1 Credits™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

CNE: The Centers for Disease Control and Prevention is accredited as a provider of Continuing Nursing Education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity provides 22.4 contact hours.

ACET CEU: The CDC has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102. The CDC is authorized by IACET to offer 2.5 ANSI/IACET CEU's for this program.

CECH: Sponsored by the Centers for Disease Control and Prevention, a designated provider of continuing education contact hours (CECH) in health education by the National Commission for Health Education Credentialing, Inc. This program is designed for Certified Health Education Specialists (CHES) to receive up to 23.0 Category I CECH in health education. CDC provider number GA0082.

AAVSB/RACE: This program has been submitted (but not yet approved) for 27.0 hours of continuing education credit in jurisdictions which recognize AAVSB RACE approval; however participants should be aware that some boards have limitations on the number of hours accepted in certain categories and/or restrictions on certain methods of delivery of continuing education. Call Sudha Pandalai at 513-533-8220 for further information.

METHOD OF PARTICIPATION:
You may participate in the educational activity by attending the conference.

To evaluate this educational activity, receive a certificate/statement of credit, and to print-out an on-going transcript of all your TCEOnline CE activities for credits/contact hours, please go to: www.cdc.gov/TCEOnline.

FEES: No fees are charged for CDC’s CE activities.

SUPPORT/FUNDING:
Funding for development of this activity was provided by the Centers for Disease Control/National Institute of Occupational Safety and Health, the Centers for Disease Control/Agency for Toxic Substances and Disease Registry, The US Army, the US Air Force, the US Environmental Protection Agency, and the Ohio Valley Society of Toxicology.

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<thead>
<tr>
<th>FACULTY/CREDENTIALS</th>
<th>AFFILIATION</th>
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<tbody>
<tr>
<td>Alarcon, Walter; MD, MSc, Medical Officer</td>
<td>The National Institute for Occupational Safety and Health</td>
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<td>Baldwin, James; PhD; Senior Scientist</td>
<td>The US Air Force</td>
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<tr>
<td>Bale, Ambuja; PhD; Biologist</td>
<td>The Environmental Protection Agency</td>
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<tr>
<td>Breitenstein, Michael; BS, Research</td>
<td>The National Institute for Occupational Safety and</td>
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<td>Name</td>
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<tr>
<td>Davis, J. Allen</td>
<td>Biologist</td>
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<td>De Perio, Marie</td>
<td>MD, Medical Officer</td>
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<tr>
<td>DeBord, Gayle</td>
<td>PhD, Associate Director for Science</td>
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<tr>
<td>Delaney, Lisa</td>
<td>MS, CIH, Deputy Associate Director</td>
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<td>Elder, Alison</td>
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<td>El-Masri, Hisham</td>
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<tr>
<td>Evans, Amanda</td>
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<tr>
<td>Fisher, Jeff</td>
<td>MS, PhD, Fellow ATS, Research Toxicologist</td>
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<tr>
<td>Flynn, Thomas</td>
<td>PhD, Research Chemist</td>
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<tr>
<td>Gargas, Michael</td>
<td>PhD, Director of the Environmental Health Effects Research Directorate of the Naval Medical Research Unit – Dayton</td>
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<tr>
<td>Giff, Jeffrey</td>
<td>PhD, Senior Scientist</td>
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<tr>
<td>Bernard Gadagbui</td>
<td>Ph.D., DABT, ERT: Toxicologist</td>
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<tr>
<td>Goodwin, Donald</td>
<td>DrPH, Chief Scientist, Epidemiology Consult Services</td>
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<tr>
<td>Haber, Lynne</td>
<td>PhD, DABT, Toxicologist</td>
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<td>Harry, G. Jean</td>
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<tr>
<td>Hartung, Thomas</td>
<td>MD, PhD; Doerenkamp-Zbinden Professor and Chair for Evidence-based Toxicology</td>
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<tr>
<td>Hein, Misty</td>
<td>MS, PhD; Statistician</td>
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<tr>
<td>Hertzberg, Richard C.</td>
<td>PhD; Consultant</td>
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<tr>
<td>Hinz, John</td>
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<tr>
<td>Hays, Sean</td>
<td>MS, PhD; President/Founder</td>
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<tr>
<td>Intano, Gabriel</td>
<td>MS, PhD; Captain, USAF</td>
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<td>Kavanagh, Terrance J</td>
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<td>Kraft, Andrew</td>
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<td>Koenig, Eric</td>
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<td>Lambert, Jason</td>
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<td>Lawson, Christina</td>
<td>PhD, Epidemiology Team Leader</td>
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<td>Lentz, Thomas (TJ)</td>
<td>PhD, MPH; Chief of the Document Development Branch</td>
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<td>Laurel Lloyd, MPH</td>
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<td>MacMahon, Kathleen; DVM, MS; Associate Director for Science</td>
<td>The National Institute for Occupational Safety and Health</td>
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<td>Maier, Andy; MS, PhD, DABT, CIH; Director</td>
<td>Toxicology Excellence for Risk Assessment</td>
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<td>Malarkey, David E; MS, PhD, DVM; Head, National Toxicology Program Pathology Group</td>
<td>National Institutes of Health/National Institute of Environmental Health Sciences</td>
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<td>Mattie, Dave; PhD, DABT; Senior Research Toxicologist</td>
<td>The US Air Force</td>
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<td>Mendrick, Donna; PhD, Director, Division of Systems Biology, National Center for Toxicology Research</td>
<td>The US Food and Drug Administration</td>
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<td>Mudipalli, Anu; MS, PhD; Biologist</td>
<td>The US Environmental Protection Agency</td>
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<td>Mumtaz, Moiz; PhD; Toxicologist</td>
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<td>Mumy, Karen; PhD; Research Microbiologist</td>
<td>The US Navy</td>
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<td>Nadadur, Sri; PhD; Health Scientist Administrator Cellular, Organs, and Systems Pathology Branch</td>
<td>The National Institutes of Health/The National Institute of Environmental Health Sciences</td>
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<td>Nichols, Tonya L.; PhD; Associate Division Director</td>
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<td>Pandalai, Sudha P.; MD, PhD; Medical Officer</td>
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<td>Patton, Geoffrey; PhD; Toxicologist</td>
<td>The US Food and Drug Administration</td>
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<td>Reeves, Will K.; PhD; Entomologist</td>
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<td>Rice, Glenn; ScD; Environmental Health Scientist</td>
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<td>Roszell, Laurie; PhD, DABT, Toxicologist</td>
<td>The US Army</td>
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<td>Ruder, Avima; PhD, Epidemiologist</td>
<td>The National Institute for Occupational Safety and Health</td>
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<td>Rusyn, Ivan; MD, PhD, Assistant Professor</td>
<td>University of North Carolina</td>
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<tr>
<td>Schrader, Steven; PhD, Research Biologist</td>
<td>The National Institute for Occupational Safety and Health</td>
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<td>Schubauer-Berigan, Mary; MS, PhD, Epidemiologist</td>
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<td>Shapiro, Andy; BSPH; Senior Associate</td>
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<td>Simmons, Jane Ellen; MSPH, PhD, DABT; Chief, Pharmacokinetics Branch</td>
<td>The US Environmental Protection Agency</td>
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<td>Snawder, John; PhD, DABT; Research Biological Scientist</td>
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<td>Sofge, Christine; PhD; Chief/REB/EID</td>
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<td>Sonntag, David; PhD, MSPH</td>
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<tr>
<td>Sweeney, Lisa; PhD, DABT, CHMM; Senior PBPK Toxicologist</td>
<td>Henry M. Jackson Foundation for the Advancement of Military Medicine; Wright Patterson AFB, Ohio</td>
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<tr>
<td>Taulbee, Tim; PhD, Research Health Scientist</td>
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<tr>
<td>Alison Elder</td>
<td>The University of Rochester</td>
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<td>Amanda Evans</td>
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<td>Summit Toxicology LLP</td>
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<td>Biomatamathics Consulting</td>
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<td>Russ Savage</td>
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<tr>
<td>Justin Teeguarden</td>
<td>Pacific Northwest National Laboratory</td>
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<td>Ying Xia</td>
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<td>Judith Zelikoff</td>
<td>New York University</td>
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2012 Toxicology and Risk Assessment Conference
Biochemical Interactions: From Molecules to Man

CONFERENCE PROGRAM ADDENDUM

April 30- May 03, 2012

Conference Disclaimer

The findings and conclusions presented in the workshops, plenary, and main session platform presentations, poster session presentations, and CE activities in this conference are solely those of the planners/presenters/authors and do not represent any policy or agency determination of any of the sponsoring agencies or organizations of the Toxicology and Risk Assessment Conference, unless expressly noted.
Monday, April 30, 2012 1:00 pm – 5:00 pm

Workshops

1:00 pm  W-1. Physiologically Based Pharmacokinetic Models in Risk Assessment *
          No addendum items

1:00 pm  W-2. Fundamentals in Cancer Risk Assessment - An Introduction to Underlying Biology and Basic Quantitative Risk Assessment Methods *
          No addendum items

1:00 pm  W-3. Crash Course in Human Health Risk Assessment of Environmental Chemicals *
          No addendum items

Tuesday, May 1, 2012  8:30 am – 11:45 am

Plenary Session  1A. Hydraulic Fracturing

9:15 am  Title Change: Hydraulic Fracturing Research at EPA
          Christopher A. Impellitteri, PhD; Chief, Water Quality Management Branch, The US Environmental Protection Agency – Abstract and/or biosketch added to Addendum, not included in archived agenda

Tuesday, May 1, 2012 1:00 pm – 5:00 pm

2A. Using *in vitro* Models to Predict Outcomes from Human Exposure

1:15 pm  Speaker and Time Change: *In vivo, in vitro* and in Silico Methods for Neurotoxicity Risk Assessment: Can We All Get along or are We all Wrong?
          Christine Perdan Curran, PhD, Northern Kentucky University, Highland Heights, KY – Abstract and/or biosketch added to Addendum, not included in archived agenda

2:00 pm  Time Change: Understanding Developmental Toxicity in vitro
          Ying Xia, PhD, University of Cincinnati, Cincinnati, OH

2B. Occupational Epidemiology – Current Updates

1:35 pm  ABLES – Trends in Lead Exposure and Surveillance in the US
Walter Alarcon, MD, MSc, National Institute for Occupational Safety and Health, Cincinnati, OH – Abstract and/or biosketch added to Addendum, not included in archived agenda

3:15 pm Occupational Exposure to Arthropod-borne Diseases in the Military. A Case Study
Will K. Reeves, PhD, US Air Force, Wright Patterson Air Force Base, OH – Abstract and/or biosketch added to Addendum, not included in archived agenda

Biosketch
Dr. Will K. Reeves, PhD

Dr. Will Reeves is an Entomologist at the Epidemiology Consult Service, USAF School of Aerospace Medicine, Wright-Patterson AFB, Ohio. He has both a PhD and MS in Entomology from Clemson University, South Carolina, and a BS in Applied Biology from the Georgia Institute of Technology, Georgia.

Wednesday, May 2, 2012 8:30 am – 11:45 am

3A. Metal-based Engineered Nanomaterials: Our Current Understanding on Potential Health Implications
No addendum items

3B. Correlating in vitro Data to in vivo Findings for Risk Assessment
No addendum items

3C. Physiologically-Based Pharmacokinetic Modeling
No addendum items

Wednesday, May 2, 2012 1:00 pm – 5:00 pm

1:00 pm -1:15 pm General Remarks
John Lipscomb, PhD, DABT, Fellow ATS, US Environmental Protection Agency, Cincinnati, OH;
Anu Mudipalli, MS, PhD, United States Environmental Protection Agency, Research Triangle Park, NC

4A. Factors Contributing to Variability: Conundrums in Occupational Risk Assessment

Additional Co-chair: Kevin Ulmes, BCE, US Army, Aberdeen Proving Grounds, MD

1:15 pm Title Change: Taking Temporal Patterns of Exposure to Task: Aligning Variable Exposure Scenarios and Risk Assessment Values
Andy Maier, MS, PhD, DABT, CIH, Toxicology Excellence for Risk Assessment, Cincinnati, OH

2:15 pm Title Change: Military Exposure Guidelines: An Overview and Look Forward
Kevin Ulmes, BCE, US Army, Aberdeen Proving Grounds, MD
Laurie E. Roszell PhD, Rebecca Martin, Matt McAtee
U.S. Army Public Health Command
Environmental Health Risk Assessment Program
4B. **Biological Toxicants**  
No addendum items

4C. **Occupational Epidemiology - Study Design and Data Issues for Risk Assessment**

3:15 pm  
**Crowd-Sourced Disaster Data**  
David Sonntag, PhD, MSPH, US Air Force, Wright Patterson Air Force Base, OH –  
Abstract and/or biosketch added to Addendum, not included in archived agenda

3:45 pm  
**Title Change: Epidemiologic Considerations for a Study of Associations Between Cr+6 in Drinking Water and Human Health**  
Donald Goodwin, DrPH, US Air Force, Wright Patterson Air Force Base, OH

**Thursday, May 3, 2012**  
8:30 am – 5:00 pm

8:30 am - 12:00  
**W-4. Cumulative Risk Assessment: Grouping and Analyzing Combined Chemical, Biological, Physical and Socio-Economic Stressors**  
No addendum items

8:30 am - 12:00  
**W-5. Benchmark Dose Modeling: Theory and Application of Basic Modeling Methodologies in Risk Assessment**  
**Addendum:** Jeff Gift, PhD, US Environmental Protection Agency, Research Triangle Park, NC will not be participating as faculty

8:30 am - 12:00  
**W-6. Chemical-Specific Adjustment Factors: Application of Data to Reduce Uncertainty in Inter- and Intraspecies Extrapolation for Chemical Risk Assessment**  
No addendum items

8:30 am - 12:00  
**W-7. Exposure-Response Arrays and Other Modes for Visualizing Toxicological Data for Risk Assessment**  
No addendum items

1:00 pm – 5:00 pm  
**W-4. Cumulative Risk Assessment: Grouping and Analyzing Combined Chemical, Biological, Physical and Socio-Economic Stressors (continued)**  
No addendum items

1:00 pm – 5:00 pm  
**W-8. Benchmark dose modeling: Advanced methodologies and tools for performing more complex dose response analyses**  
**Addendum:** Jeff Gift, PhD, US Environmental Protection Agency, Research Triangle Park, NC will not be participating as faculty
CONTINUING EDUCATION INFORMATION – UPDATED

For further details, please see the Continuing Education Evaluation Booklet, which is available at the Materials Pick-up location.

The 2012 Toxicology and Risk Assessment Conference Continuing Education Accreditation Statement:

CME: This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the Centers for Disease Control & Prevention and The U.S. Environmental Protection Agency. The Centers for Disease Control and Prevention is accredited by the Accreditation Council for Continuing Medical Education (ACCME®) to provide continuing medical education for physicians.

The Centers for Disease Control and Prevention designates this live educational activity for a maximum of 22.5 AMA PRA Category 1 Credits™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

CNE: The Centers for Disease Control and Prevention is accredited as a provider of Continuing Nursing Education by the American Nurses Credentialing Center's Commission on Accreditation. This activity provides 22.4 contact hours.

IACET CEU: The CDC has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102. The CDC is authorized by IACET to offer 2.5 ANSI/IACET CEU's for this program.

CECH: Sponsored by the Centers for Disease Control and Prevention, a designated provider of continuing education contact hours (CECH) in health education by the National Commission for Health Education Credentialing, Inc. This program is designed for Certified Health Education Specialists (CHES) to receive up to 23.0 Category I CECH in health education. CDC provider number GA0082.

AAVSB/RACE: This program has been submitted (but not yet approved) for 27.0 hours of continuing education credit in jurisdictions which recognize AAVSB RACE approval; however participants should be aware that some boards have limitations on the number of hours accepted in certain categories and/or restrictions on certain methods of delivery of continuing education. Call Sudha Pandalai at 513-533-8220 for further information.

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<tr>
<td>Faculty/Credentials</td>
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<td><strong>Additional Faculty:</strong></td>
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<tr>
<td>Christopher A. Impellitteri, PhD; Chief, Water Quality Management Branch</td>
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<tr>
<td><strong>Previously Listed Faculty who will not be Participating</strong></td>
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<tr>
<td>Gift, Jeffrey; PhD; Senior Scientist</td>
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