

Thirty-fourth Annual Meeting of the Neurobehavioral Teratology Society

Held in Conjunction with the 50th Annual Meeting of the Teratology Society and the 22nd Annual Meeting of the Organization of Teratology Information Specialists

Louisville, KY June 26 – June 30, 2010

Saturday, June 26, 2010

- 8:00 a.m.-11:30 a.m. Teratology Society Education Course*: *Marriott Ballroom 6*
12:30 a.m.-5:30 p.m. Teratology Society/OTIS Pregnancy Workshop*: *Marriott Ballroom 9*
1:30 p.m.-4:45 p.m. Teratology Society Education Course*: *Marriott Ballroom 6*
*Separate Registration
- 1:00 p.m.-5:00 p.m. NBTS Registration: *Marriott Ballroom 7 Foyer*
1:00 p.m.-2:00 p.m. NBTS Public Affairs Committee: *Filly Meeting Room*
2:00 p.m.-3:00 p.m. NBTS Publications Committee Meeting: *Filly Meeting Room*
3:00 p.m.-6:00 p.m. NBTS Council Meeting: *Filly Meeting Room*

Sunday, June 27, 2010

- 8:00 a.m.-5:00 p.m. NBTS Registration: *Marriott Ballroom 7 Foyer*
- 7:45 a.m.-8:15 a.m. Continental Breakfast: *Marriott Ballroom 7*
- 8:15 a.m.-8:30 a.m. **President's Welcome and Official Opening of 2010 NBTS Meeting**
Marriott Ballroom 7
- 8:30 a.m.-12:00 a.m. **Session 1, Behavioral Toxicology Symposium,**
Behavioral Toxicology of Cognition: Extrapolation from
Experimental Animal Models to Humans
Chairperson: Merle Paule, National Center for Toxicological Research
Marriott Ballroom 7
- 8:30-8:50 Introduction
Merle Paule
National Center for Toxicological Research, Jefferson, AR
- 8:50-9:25 Delay Discounting by Humans and Other Animals: Does the Species Matter?
Leonard Green
Washington University, St. Louis, MO
- 9:25-10:00 The Use of "Animal" Tests of Cognition in Children
William H. Overman
University of North Carolina, Wilmington, NC
- 10:00-10:15 Break

10:15-10:50 Modeling the Cognitive Deficits of Parkinson's Disease

Jay Schneider

Thomas Jefferson University, Philadelphia, PA

10:50-11:25 Delineating Behavioral Domains Underlying Lead-Induced Cognitive Deficits

Deborah Cory-Slechta

University of Rochester Medical School, Rochester, NY

11:25-12:00 Perinatal PCB Exposure and Deficits In Inhibitory Control: Parallels Between Animals And Humans

Susan Schantz

University of Illinois, Urbana IL

12:00 p.m.-1:20 p.m. **Lunch on your own**

1:20 p.m.-3:00 p.m. **Session 2, NBTS Platform Talks: Marriott Ballroom 7**

Chairperson: Phillip Bushnell, US-Environmental Protection Agency

1:20 p.m.-1:40 p.m. The Effect of 2,4-Dichlorophenoxyacetic Acid on Anxiety in the Rat.

William Hamlet, Sandra McFadden, Russell Morgan, Amy Vaught

Western Illinois University, Macomb, IL

1:40 p.m.-2:00 p.m. Prenatal Exposure to Phthalates and Newborn Neurobehavior

Kimberly Yolton, Yingying Xu, Jane Khoury

Cincinnati Children's Hospital, Cincinnati, OH

2:00 p.m.-2:20 p.m. Early Developmental Chlorpyrifos Causes Persisting Behavioral and Neurochemical Changes in Zebrafish

Damiyon Sledge, Ann Petro, Jerry Yen, Susan Donerly, Elwood Linney, Edward Levin

Duke University Medical Center, Durham, NC

2:20 p.m.-2:40 p.m. Reversal of Chlorpyrifos Neurobehavioral Teratogenicity in Mice by Adult Allographic Subventricular Zone-derived Neural Stem Cell Transplantation

Joseph Yanai^{1,2}, Adi Pinkas¹

¹The Ross Lab for Studies in Neural Birth Defects, Department of Medical Neurobiology, IMRIC, Hebrew University-Hadassah Medical School, Jerusalem, Israel, ²Department of

Pharmacology and Cancer Biology, Duke Medical School, Durham, NC

2:40 p.m.-3:00 p.m. The Long-term Behavioral Effects of Exposure to Metals and Chronic Stress during Development

Devon Graham^{1,2}, Robyn Amos-Kroohs^{1,2}, Amanda Braun^{1,2}, Curtis Grace^{1,2}, Tori Schaefer^{1,2}, Matthew Skelton^{1,2}, Charles Vorhees^{1,2}, Michael Williams^{1,2}

¹Cincinnati Children's Research Foundation, Cincinnati, OH, ²University of Cincinnati, Cincinnati, OH

3:00 p.m.-3:20 p.m. Break: *Marriott Ballroom 7 Foyer*

3:20 p.m.-5:00 p.m. **Session 3, NBTS Platform Talks:** *Marriott Ballroom 7*
Chairperson: Lori Driscoll, Colorado College

3:20 p.m.-3:40 p.m. Effects of 3,4-Methylenedioxymethamphetamine (MDMA) on Serotonin Transporter and Vesicular Monoamine Transporter 2 Protein and Gene Expression in Rats: Implications for MDMA Neurotoxicity

Dominik Biezonski^{1,2}, Jerrold Meyer¹

¹University of Massachusetts, Amherst, MA, ²Harvard Medical School, Southborough, MA

3:40 p.m.-4:00 p.m. Effects of Prenatal Cocaine on Conditioned Place Preference in Adolescence: Modification by Post-weaning Housing and Sex

Diana Dow-Edwards¹, Sari Izenwasser¹

¹State University of New York, Brooklyn, NY, ²University of Miami School of Medicine, Miami, FL

4:00 p.m.-4:20 p.m. Evidence for Rapid Sensitization to the Stimulant Effects of MDMA in Adolescent Rats

Jerrold Meyer, Peter Kim, Frederico Fernandes, Dominik Biezonski, Brian Piper
University of Massachusetts, Amherst, MA

4:20 p.m.-4:40 p.m. Methylphenidate-Induced Developmental Neurobehavioral Toxicity in Zebrafish

Edward Levin, Damiyon Sledge, Stephanie Roach, Susan Donerly, Elwood Linney
Duke University, Durham, NC

4:40 p.m.-5:00 p.m. Effects of Overlapping Ages of Exposure to (+)-Methamphetamine (MA) in Rats on Later Allocentric and Egocentric Learning

Charles Vorhees, Matthew Skelton, Devon Graham, Tori Schaefer, Curtis Grace, Amanda Braun, Robyn Amos-Kroohs, Michael Williams
Cincinnati Children's Hospital Medical Center, Cincinnati, OH

6:00 p.m.-8:00 p.m. **Joint NBTS/TS/OTIS Welcome Reception:** *Marriott Ballroom 1*

Monday, June 28, 2010

8:00 a.m.-5:00 p.m. NBTS Registration: *Marriott Ballroom 7 Foyer*

7:45 a.m.-8:15 a.m. Continental Breakfast: *Marriott Ballroom 7*

8:15 a.m.-9:00 a.m. **Session 4, Elsevier Distinguished Lectureship**
Bisphenol-A Impacts on Sex Differences in Neural Processes
Neil MacLusky, University of Guelph, ON
Marriott Ballroom 7

9:15 a.m.-11:45 a.m. **Session 5, Reproductive Psychiatry Symposium (NBTS/OTIS/TS)**
Chairpersons: Katherine L. Wisner, University of Pittsburgh
Medical Center and Adrienne Einarson , The Motherisk Program
Marriott Ballroom 6

9:15 a.m.–9:20 a.m. Introduction

9:20 a.m.–9:50 a.m. Where Does Neonatal Behavioral Syndrome End and
Neurobehavioral Teratogenicity Begin?
Tim F. Oberlander, University of British Columbia, Vancouver, BC

9:50 a.m.–10:20 a.m. Messages from the Womb: Maternal Antidepressant Use and Fetal
Neurobehavior
Amy L. Salisbury, Alpert Medical School of Brown University, Providence, RI

10:20 a.m.–10:50 a.m. An Update on Lithium Treatment during Pregnancy and Lactation
Adele C. Viguera, Neurological Institute, Cleveland Clinic, Cleveland, OH

10:50 a.m.–11:20 a.m. Effects of Developmental Exposure to Methylphenidate on Brain
Areas Involved in Cognition, Motivated Behaviors, Appetite and Stress
Teresa Ann Milner, Weill Cornell Medical College, New York City, NY

11:20 a.m.–11:45 a.m. Discussion: How Do We Incorporate These Data into Human Risk
Assessment?
Katherine L. Wisner, University of Pittsburgh Medical Center, Pittsburgh, PA

12:00 p.m.-1:15 p.m. **Lunch on your own**

1:15 p.m.-4:45 p.m. **Session 6, Symposium**
Complementary Zebrafish Models for Neurobehavioral
Teratology Research: Opportunities and Challenges
Chairperson: Edward D. Levin, Duke University Medical Center
Marriott Ballroom 7

1:15 p.m.-1:45 p.m. Embryonic Exposure to Low Levels of Alcohol: Towards the
Development of a Realistic Zebrafish Model of Fetal Alcohol Syndrome
Robert Gerlai, University of Toronto, Toronto, ON

1:45-2:15 Ethanol-induced Effects on Neurobehavioral Function: the Developmental
Neurotoxicity of MicroRNAs
Tamara Tal, Katerine Saili, Jill Franzosa, Robert Tanguay
Oregon State University, Corvallis, OR

2:15 p.m.-2:45 p.m. Do NMDA Receptor Antagonists Alter Structural and Functional
Development in Zebrafish?

Frank Scalzo
Bard College, Annandale-on-Hudson, NY

2:45 p.m.-3:00 p.m. Break: *Marriott Ballroom 7 Foyer*

3:00 p.m.-3:30 p.m. Evaluating the Behavioral Impact of Toxicants in Larval Zebrafish
Robert MacPhail
US Environmental Protection Agency, Research Triangle Park, NC

3:30 p.m.-4:00 p.m. Using the Zebrafish (*Danio rerio*) Model to Investigate Changes in Gene Expression and Behavior following Developmental Exposure to Pyrethroid Pesticides
Lori White¹, Keith Cooper¹, Amy DeMicco¹, Jason Richardson²
¹Rutgers, The State University of NJ, New Brunswick, NJ, ²Environmental and Occupational Health Sciences Institute, UMDNJ, Piscataway, NJ

4:00 p.m.-4:30 p.m. Using Zebrafish to Investigate Persisting Cognitive and Sensorimotor Effects of Early Developmental Chlorpyrifos Exposure
Edward D. Levin
Duke University Medical Center, Durham, NC

4:30-4:45 Discussion

5:00 p.m.-7:00 p.m. **Joint Poster Session I (NBTS/TS/OTIS) and Exhibits Open**
(Posters set up at 11:45 a.m., attended 5:00 – 7:00 p.m.)
Marriott Ballroom 1

Neurobehavioral Development following Exposure of Male Mice to Polybrominated Diphenyl Ether 47 on Postnatal Day 10
Virginia Moser¹, Pamela Phillips¹, Katherine McDaniel¹, Jill Gee^{1,2}
¹US Environmental Protection Agency, Research Triangle Park, NC, ²North Carolina State University, Raleigh, NC

Subsequent Effects on Open-field Responses of Exposing Male and Female Hooded Rats Each Day to Alcohol, Caffeine and their Combination during Early and Mid to Late Adolescence, and Early Adulthood.
Rob Hughes
University of Canterbury, Christchurch, New Zealand

Gene Expression in Developing Brain is Altered by Modest Reductions in Circulating Levels of Thyroid Hormone.
Mary Gilbert, Kevin Crofton, Gail Nelson, Jeremy Knapp
US Environmental Protection Agency, Research Triangle Park, NC

Molecular (Mal)adaptations in Dopamine-modulated Signaling Pathways following Neurodevelopmental Insult

Aliya Frederick, Roger Colbran, Gregg Stanwood
⁴Vanderbilt University, Nashville, TN

Effects of Methylphenidate on Motivation in Children with Attention-Deficit/Hyperactivity Disorder

John Chelonis^{1,2}, Teresa Johnson², Sherry Ferguson^{1,2}, Brian Kubacak², Mark Edwards², Merle Paule^{1,2}

¹National Center for Toxicological Research, FDA, Jefferson, AR, ²University of Arkansas for Medical Sciences/Arkansas Children's Hospital, Little Rock, AR

Effect of Lifetime Exposure to Acrylamide on Motor Nerve Conduction Velocity in Rats at One Year of Age

Joan Garey¹, Zbigniew Binienda², Merle Paule²

¹SRC, Inc, Arlington, VA, ² National Center for Toxicological Research, FDA, Jefferson, AR

Tuesday, June 29, 2010

8:00 a.m.-5:00 p.m. NBTS Registration: *Marriott Ballroom 7 Foyer*

7:45 a.m.-8:15 a.m. Continental Breakfast: *Marriott Ballroom 7*

8:30 a.m.-9:15 a.m. **Special Lecture (NBTS/TS/OTIS)**

Children's Environmental Health: A Good Start Lasts a Lifetime

Linda S. Birnbaum, National Institute of Environmental Health Sciences

Marriott Ballroom 6

9:30 a.m.-12:00 p.m. **Session 7, Symposium (NBTS/TS)**

**Advancing Neurodevelopmental Evaluation in Children:
An Interdisciplinary Approach**

Chairperson: Susan Makris, US Environmental Protection Agency

Marriott Ballroom 6

9:30 a.m.-9:55 a.m. The Use of Neurodevelopmental Data in Children for Risk Assessment of Environmental Chemicals

Susan Makris, US Environmental Protection Agency, Washington, DC

9:55 a.m.-10:20 a.m. A Multidisciplinary Approach to Advancing the Science of Neurodevelopmental Testing in Cohorts of Infants and Young Children

Judy S. LaKind, LaKind Associates, LLC, Baltimore, MD

10:20 a.m.-10:45 a.m. How to Get the Biggest Bang for Your Buck: Choosing Neurodevelopmental Tests that Maximize Power

Lauren Kenworthy, George Washington University Medical School, Washington, DC

10:45 a.m.-11:10 a.m. Threats to Study Validity: The Flynn Effect, Examiner Drift, Confounders, Lost in Translation, and Other Important Considerations

Laura Gutermuth Anthony, George Washington University School of Medicine,
Washington, DC

11:10 a.m.–11:35 a.m. Weight-of-the-Evidence Assessment in Neurodevelopmental
Epidemiology: A Plea for Consistency

Michael Goodman, Emory University, Atlanta, GA

11:35 a.m.–12:00 p.m. Panel Discussion

12:00 p.m.–2:00 p.m. **NBTS/TS Joint Lunchtime Poster Session II and Exhibits Open**
(Posters set up at 11:45 a.m., attended 12:00 – 2:00 p.m.)

Marriott Ballroom 1

Effects of Domoic Acid on Early Visual Memory in Infants from the CoASTAL Cohort
Kimberly Grant¹, Tom Burbacher¹, Sparkle Roberts², Lynn Grattan²

¹University of Washington, Seattle, WA, ²University of Maryland, Baltimore, MD

Acute Postnatal Exposure to the PentaBDE Commercial Mixture DE-71 at Low Doses (5
or 15 mg/kg/day) Does Not Produce Learning or Attention Deficits in Rats

Lori Driscoll

Colorado College, Colorado Springs, CO

Gene-toxicant Interactions: Developmental PBDE Effects on the Behavioral Phenotype
of the Mecp2-308 Rett Syndrome Mouse Model

Mari Golub, Roxanne Vallero, Joanne Suarez, Ta Tram Anh, Isaac Pessah, Robert
Berman, Janine LaSalle

University of California Davis, Davis, CA

Locomotor Responding in Adolescent CD-1 Mice following Acute and Chronic Cocaine
Administration is Unaffected by Low Dose Perinatal Bisphenol A Exposure

Jenna Nelms, Abby Meyer, Mellessa Miller, Melissa Ward, Helen Sable

University of Memphis, Memphis, TN

Developmental Neurobehavioral Toxicity of Bisphenol A: Defining the Role of Estrogen
Related Receptor Gamma

Katerine Saili, Jane LaDu, Michael Simonich, Robert Tanguay

Oregon State University, Corvallis, OR

2:00 p.m.–3:40 p.m. **Session 8, NBTS Platform Talks: Marriott Ballroom 7**

Chairperson: Diana Dow-Edwards, Downstate Medical Center,
Brooklyn, NY

2:00 p.m.–2:20 p.m. Genetic Susceptibility to PCB-induced Motor Dysfunction

Chris Curran, Emily Altenhofen, Amber Evans, Rikki Floyd, Cellestine Kamau-Cheggeh,
Sarah Kraemer, Breann Hays, Kristi Haik

Northern Kentucky University, Highland Heights, KY

2:20 p.m.-2:40 p.m. Assessment of Prefrontal Cortical Functions in Mice with Genetic and Dietary Alterations of Folate Status

Jessica Ash, Barbara Strupp
Cornell University, Ithaca, NY

2:40 p.m. -3:00 p.m. Behavioral Outcome in Children Exposed Prenatally to Lamotrigine, Valproate, or Carbamazepine: Increased Risks for Valproate

Uma Deshmukh¹, Jane Adams², Ruby Dhillon¹, Katherine McCarthy¹, Eric Macklin¹, Lewis Holmes^{1,3}

¹Massachusetts General Hospital, Boston, MA, ²University of Massachusetts Boston, Boston, MA, ³Harvard Medical School, Boston, MA

3:00 p.m.-3:20 p.m. Effects of Age of Exposure to 3,4-Methylenedioxymethamphetamine (MDMA) in Rats on Later Learning and Behavior

Charles Vorhees, Matthew Skelton, Devon Graham, Tori Schaefer, Curtis Grace, Amanda Braun, Michael Williams
Cincinnati Children's Hospital Medical Center, Cincinnati, OH

3:20 p.m.-3:40 p.m. Predicting the Acute Behavioral Effects in Rats Inhaling Toluene for Up to 24 hrs: Inhaled vs. Internal Dose Metrics and Tolerance.

WM Oshiro, QT Krantz, CJ Gordon, EM Kenyon, and PJ Bushnell
US Environmental Protection Agency, Office of Research and Development, National Health Effects and Environmental Research Laboratory, Research Triangle Park, NC

3:40-4:00 Break: *Marriott Ballroom 7 Foyer*

4:00 p.m.-5:30 p.m. **Annual NBTS Business Meeting:** *Marriott Ballroom 7*

6:00 p.m.-9:00 p.m. **NBTS Social Event, Riverboat Cruise**

Wednesday, June 30, 2010

7:30 a.m.-9:00 a.m. Continental Breakfast: *Marriott Ballroom 7*

9:00 a.m.-10:45 a.m. **Session 9, Future Directions in Neurobehavioral Teratology Roundtable**
Discussants: Philip Landrigan, Jerrold Meyer, Susan Schantz, Lynn Singer, Charles Vorhees,
Marriott Ballroom 7

10:45 a.m.-11:00 a.m. Break: *Marriott Ballroom 7 Foyer*

11:00 a.m.-12:00 p.m. **Session 10, National Children's Study Panel (NBTS/TS)**
Marriott Ballroom 6

12:00 p.m. **NBTS 2010 Formally Adjourned**