



**Thirty-second Annual Meeting of the Neurobehavioral Teratology Society**  
Held in Conjunction with the 48th Annual Meeting of the Teratology Society and the  
21st Annual Meeting of the Organization of Teratology Information Specialists

Hyatt Regency Hotel  
Monterey, CA  
June 28–July 2, 2008

**NBTS 2008 DR. RICHARD BUTCHER NEW INVESTIGATOR AWARD**

DAVID S. SHARLIN (nominated by M.E. Gilbert)

NIDDK, National Institutes of Health, Washington DC

The Balance Between Oligodendrocyte and Astrocyte Production in Major White Matter Tracts is Linearly Related to Serum Total Thyroxine.

**MERCK and Co., Inc. CONFERENCE AWARD**

DEVON GRAHAM (nominated by Michael Williams)

Cincinnati Children's Research Foundation, Cincinnati, Ohio

Differential Neurochemical Consequences of an Escalating Dose-Binge Regimen Followed by Single-Day Multiple-Dose Methamphetamine Challenges.

**SOT NEUROTOXICOLOGY SPECIALTY SECTION CONFERENCE AWARD**

JEANNETTE STANKOWSKI (nominated by Gregg Stanwood)

Vanderbilt University Medical Center, Nashville, TN

Selective Vulnerability of Dopaminergic Systems to Manganese: Relevance to Occupational Exposure.

**FINE SCIENTIFIC TOOLS CONFERENCE AWARD**

JILLIAN GEE (nominated by Ginger Moser)

Neurotoxicology Division, US EPA, RTP, NC and North Carolina State University, Raleigh, NC

Acute Developmental Exposure to Polybrominated Diphenyl Ether 47 (PBDE 47) Alters Dopamine Concentration within the Brain of Male Mice.

**NBTS CONFERENCE AWARD**

Sherin Boctor (nominated by Sherry Ferguson)

Department of Interdisciplinary Biomedical Sciences, U Arkansas and NCTR/FDA, Little Rock, Arkansas

Neonatal NMDA Receptor Antagonist Treatment Has No Effects on Prepulse Inhibition (PPI) in Postnatal Day (PND) 25 Sprague-Dawley Rats.

**NBTS 2008 PROGRAM**

**Saturday, June 28, 2008**

- 7:00 a.m.–5:00 p.m. Teratology Society Continuing Education Course – Regency Ballroom  
“Functional Development of the CNS: Positive and Negative Factors” (Separate Registration through TS Required)
- 1:00 p.m.–6:00 p.m. NBTS Registration and Committee Meetings – Regency Rooms Foyer
- 2:00 p.m.–3:00 p.m. NBTS Public Affairs Committee Meeting – Cypress 1

2:00 p.m.–3:00 p.m. NBTS Publications Committee Meeting – Cypress 2  
 3:30 p.m.–5:30 p.m. NBTS Council Meeting – Cypress 2

**Sunday, June 29, 2008**

8:00–5:00 p.m. NBTS Registration – Regency 4 Foyer

8:45–8:50 a.m. Welcome and Official Opening of 2008 NBTS meeting.

8:45–11:00 a.m. NBTS Symposium 1 – Regency Rooms 4–6  
 Prenatal Behavior and Transition to Postnatal Life Chair – Mark Stanton, Mary Gilbert

8:45–8:55 a.m. NBTS1. Prenatal behavior and transition to postnatal life. Mark Stanton. *Psychology Department, University of Delaware, USA*

8:55–9:30 a.m. NBTS2. The externalized rodent fetus: A model system for the study of prenatal behavioral development. Scott Robinson, *University of Iowa, USA*

9:30–10:05 a.m. NBTS3. Behavioral functioning of the fetus after prenatal toxin exposure and neural insult. Gale Kleven, *Wake Forest University, USA*

10:05–10:40 a.m. NBTS4. Birth and postnatal life: insights derived from neural imaging and behavioral studies of perinatal rats. April Ronca, *Wake Forest University, USA*

10:40–11:00 a.m. Break

11:00–11:45 a.m. Special Lecture – Regency Rooms 4–6  
 NBTS5. Thyroid disruption and brain development: Does serum T4 tell the story? Robert Zoeller<sup>1</sup>, Ruby Bansal<sup>1</sup>, Daniel Tighe<sup>1</sup>, David Sharlin<sup>1</sup>, Mary Gilbert<sup>2</sup>, Jeffrey Fisher<sup>3</sup>, Benjamin Blount<sup>4</sup>, <sup>1</sup>*University of Massachusetts*, <sup>2</sup>*U.S. EPA*, <sup>3</sup>*University of Georgia*, <sup>4</sup>*Center for Disease Control and Prevention, USA*

11:45–12:15 p.m. Dr. Richard Butcher New Investigator Award Recipient  
 NBTS6. The balance between oligodendrocyte and astrocyte production in major white matter tracts is linearly related to serum total thyroxine. David Sharlin<sup>1,2</sup>, Daniel Tighe<sup>1</sup>, Mary Gilbert<sup>3</sup>, R. Thomas Zoeller<sup>2</sup>, <sup>1</sup>*NIDDK, National Institutes of Health, Washington, DC*, <sup>2</sup>*University of Massachusetts*, <sup>3</sup>*Neurotoxicology Division, U.S. EPA, USA*

12:45–5:00 p.m. Carmel Valley Wine Tasting Tour – Assemble in Lobby 12:30

6:00 p.m.–7:30 p.m. Welcoming Reception (TS/NBTS/OTIS) and Exhibits Open  
 Monterey Ballroom

**Monday, June 30, 2008**

8:00 a.m.–5:00 p.m. NBTS Registration – Regency Room 4–6 Foyer

8:30–11:30 a.m. Symposium 2 – Regency Ballroom  
 Environmental Exposures to Pesticides: Impact on Neurodevelopment  
 Chair – Susan Schantz, Mary Gilbert

8:30–8:40 a.m. NBTS7. An overview of the centers for children's environmental health and disease prevention: research, translation and outreach. Susan Schantz, *University of Illinois, United States*

8:40–9:20 a.m. NBTS8. Neurodevelopmental effects of prenatal exposure to chlorpyrifos in an urban cohort. Virginia Rauh, Robin Whyatt, Robin Garfinkel, *Columbia University, Mailman School of Public Health, United States*

9:20–10:00 a.m. NBTS9. Organophosphate exposure and neurodevelopment in a Mexican American farmworker population: The CHAMACOS Study. Brenda Eskenazi<sup>1</sup>, Amy Marks<sup>1</sup>, Kim Harley<sup>1</sup>, Asa Bradman<sup>1</sup>, Caroline Johnson<sup>2</sup>, Dana Bari<sup>3</sup>, <sup>1</sup>*University of California Berkeley*, <sup>2</sup>*Private Practice, United States*, <sup>3</sup>*CDC, United States*

10:00–10:20 a.m. Break (joint with Teratology) – Regency Ballroom Foyer

10:20–11:00 a.m. NBTS10. In utero exposure to pesticides and child neurodevelopment in a New York City cohort. Mary Wolff, Stephanie Engel, *Mount Sinai School of Medicine, USA*

11:00–11:40 a.m. NBTS11. Pesticide exposure in children: evidence for a take home pathway. Elaine Faustman<sup>1,2</sup>, <sup>1</sup>*University of Washington, United States*, <sup>2</sup>*Center for Child Environmental Health Risks Research, USA*

11:40–1:30 p.m. LUNCH

- 1:30–2:30 p.m. Elsevier Distinguished Lecturer – Regency Room 4–6  
NBTS12. Interpreting epidemiologic studies of neurotoxicity: conceptual and analytic issues. David Bellinger<sup>1,2,3</sup>,  
<sup>1</sup>Children's Hospital Boston, United States, <sup>2</sup>Harvard Medical School, United States, <sup>3</sup>Harvard School of Public Health,  
United States
- 2:30–5:30 p.m. Symposium 3 – Regency Room 4–6  
Environmental Exposures to Metals: Impact on Neurodevelopment  
Chair – Susan Schantz, Mary Gilbert
- 2:30–3:10 p.m. NBTS13. Biomarkers of genetic susceptibility to metal neurotoxicity. Robert Wright, *Harvard School of Public Health, USA*  
3:10–3:50 p.m. NBTS14. Effects of early lead exposure on neuroanatomical and social functional outcomes in young adults.  
Kim Dietrich, *University of Cincinnati College of Medicine, USA*
- 3:50–4:10 p.m. Break – Regency Room 4–6 Foyer
- 4:10–4:50 p.m. NBTS15. The impact of lead and other exposures on early school performance. Dohyeong Kim, Jerome Reiter, Andy Hull,  
Marie Lynn Miranda, *Duke University, USA*
- 4:50–5:30 p.m. NBTS16. Role of metal exposures in autism. Irva Hertz-Picciotto, Peter Green, Lora Delwiche, Isaac Pessah, Robin Hansen,  
*University of California, USA*
- 5:30–7:30 p.m. NBTS/TS/OTIS Poster Session I and Exhibits – Monterey Ballroom (Posters set-up 11:45 a.m., attended 5:30–7:30 p.m.)
- NBTS17. Thyroid disruption and brain development: What is it that we don't know? Robert Zoeller<sup>1</sup>, Ruby Bansal<sup>1</sup>,  
Stefanie Giera<sup>1</sup>, Theresa Ortiz<sup>1</sup>, Daniel Tighe<sup>1,2</sup>, David Sharlin<sup>1,3</sup>, Mary Gilbert<sup>4</sup>, <sup>1</sup>University of Massachusetts,  
<sup>2</sup>Harvard University, <sup>3</sup>NIDDK, NIH, <sup>4</sup>U.S. EPA, USA
- NBTS18. A genomic analysis of subclinical hypothyroidism in hippocampus and neocortex of the developing brain.  
Mary Gilbert<sup>1</sup>, Joel Parker<sup>2</sup>, Joyce Royland<sup>1</sup>, <sup>1</sup>US EPA, <sup>2</sup>Constella Group, USA
- NBTS19. Developmental exposure to perchlorate alters synaptic transmission in hippocampus of the adult rat. ME  
Gilbert<sup>1</sup>, Li Sui<sup>2</sup>, <sup>1</sup>US Environmental Protection Agency, <sup>2</sup>National Research Council, USA
- NBTS20. Behavioral lateralization and prenatal exposure to antiepileptic drugs: evidence for increased non-right hand  
preference. Kelly Marie McVeary<sup>1</sup>, Gholam Motamedi<sup>1</sup>, Kimford Meador<sup>2</sup>, <sup>1</sup>Georgetown University Department of  
Neurology, <sup>2</sup>University of Florida McKnight Brain Institute, USA
- NBTS21. Fetal terbutaline exposure and child neurobehavioral outcome: a preliminary evaluation. Jane Adams<sup>1</sup>,  
Stephanie Lagaert<sup>2</sup>, Patricia Janulewicz<sup>1</sup>, Kelly Kao<sup>2</sup>, Christina Chambers<sup>2</sup>, Kenneth Jones<sup>2</sup>, <sup>1</sup>University of MA Boston,  
<sup>2</sup>UCSD School of Medicine, USA
- NBTS22. Cognitive development and low-level lead exposure in poly-drug exposed children. Meeyoung Min<sup>1</sup>,  
Lynn Singer<sup>1</sup>, Sonia Minnes<sup>1</sup>, H. Lester Kirchner<sup>2</sup>, Suchitra Nelson<sup>1</sup>, <sup>1</sup>Case Western Reserve University,  
<sup>2</sup>Geisinger Center for Health Research, USA
- NBTS23. Neurobehavioral outcomes of infants exposed prenatally to MDMA. Lynn T. Singer<sup>1</sup>, Julia Goodwin<sup>2</sup>,  
Derek Moore<sup>2</sup>, Meeyoung O. Min<sup>1</sup>, Andy C. Parrott<sup>3</sup>, John Turner<sup>2</sup>, Sarah E. Fulton<sup>1</sup>, <sup>1</sup>Case Western Reserve University, USA,  
<sup>2</sup>University of East London, United Kingdom, <sup>3</sup>Swansea University, United Kingdom
- NBTS24. Female mini-pig performance of Temporal Response Differentiation (TRD), Incremental Repeated Acquisition  
(IRA), and Progressive Ratio (PR) operant tasks. Sherry Ferguson<sup>1</sup>, Neera Gopee<sup>2</sup>, Merle Paule<sup>1</sup>, Paul Howard<sup>2</sup>,  
<sup>1</sup>Division of Neurotox/National Center for Toxicological Research/FDA, <sup>2</sup>Division of Biochemical Tox/National Center  
for Toxicological Research/FDA, USA
- NBTS25. Object preferences as environmental enrichment measures in the female mini-pig. Melody Smith<sup>1</sup>, Neera Gopee<sup>2</sup>,  
Paul Howard<sup>2</sup>, Sherry Ferguson<sup>1</sup>, <sup>1</sup>Division of Neurotoxicology, National Center for Toxicological Research/FDA,  
<sup>2</sup>Division of Biochemical Toxicology, National Center for Toxicological Research/FDA, USA
- 7:30–9:30 p.m. Student Career Event – Cypress Room 1–3  
Sponsored by MARTA/MTA

**Tuesday, July 1, 2008**

- 8:00–5:00 p.m. NBTS Registration – Regency Foyer  
8:30–11:30 a.m. Symposium 4 – Regency Rooms 4–6  
Environmental Exposures to Pesticides and Metals: Animal Models  
Chair – Deborah Rice

- 8:30–8:40 a.m. NBTS26. Correspondence between experimental and epidemiological findings: How good is it? Deborah Rice, *Maine Center for Disease Control and Prevention, USA*
- 8:40–9:20 a.m. NBTS27. Developmental pesticide exposure: a new risk factor for ADHD? Jason Richardson, *Robert Wood Johnson Medical School, USA*
- 8:30–8:40 a.m. NBTS26. Correspondence between experimental and epidemiological findings: How good is it? Deborah Rice, *Maine Center for Disease Control and Prevention, USA*
- 8:40–9:20 a.m. NBTS27. Developmental pesticide exposure: a new risk factor for ADHD? Jason Richardson, *Robert Wood Johnson Medical School, USA*
- 9:20–10:00 a.m. NBTS28. Long-term cognitive effects of low-level developmental organophosphate pesticide exposure: divergent effects of chlorpyrifos, diazinon and parathion. Edward Levin, Olga Timofeeva, Frederic Seidler, Theodore Slotkin, *Duke University, USA*
- 10:00–10:20 a.m. Break – Regency Room Foyer
- 10:20–11:00 a.m. NBTS29. The efficacy of succimer chelation in an animal model of pediatric lead exposure. Barbara Strupp<sup>1</sup>, Diane Stangle<sup>1</sup>, Myla Strawderman<sup>1</sup>, Stephane Beaudin<sup>1</sup>, Donald Smith<sup>2</sup>, <sup>1</sup>*Cornell University, United States*, <sup>2</sup>*University of California at Santa Cruz, USA*
- 11:00–11:40 a.m. NBTS30. Effects of in utero and lactational manganese exposure on behavioural and neurochemical outcomes in rats. Timothy Maher, Siripan Phattanarudee, *Massachusetts College of Pharmacy and Health Sciences, USA*
- 11:45–1:30 p.m. NBTS/TS/OTIS Poster Session II and Exhibits – Monterey Ballroom (Posters set-up 9:00 a.m., attended 11:45–1:30 p.m.)
- NBTS31. Conversion of Developmental Neurotoxicity (DNT) information into a structure-searchable relational database. Karen Acuff<sup>1</sup>, Bill Broening<sup>1</sup>, Kevin Crofton<sup>2</sup>, Andrew Fix<sup>1</sup>, Elizabeth Julien<sup>3</sup>, Jay Nash<sup>1</sup>, Ann Richard<sup>2</sup>, Sarah Tozer<sup>1</sup>, Chihae Yang<sup>4</sup>, <sup>1</sup>*Procter & Gamble Company, United States*, <sup>2</sup>*EPA, ORD*, <sup>3</sup>*ILSI Research Foundation*, <sup>4</sup>*Leadscope, Inc., USA*
- NBTS32. Neurobehavioral consequences of developmental PCB95 exposure in mice. Mari Golub, Isaac Pessah, Robert Berman, *University of California Davis, USA*
- NBTS33. The effects of gestational and lactational exposure to chromium picolinate or picolinic acid on neurological development of CD-1 mice. Melissa Bailey<sup>1</sup>, Megan Townsend<sup>1</sup>, Peter Jernigan<sup>1</sup>, John Sturdivant<sup>1</sup>, Jane Rasco<sup>1</sup>, John Vincent<sup>1</sup>, Ronald Hood<sup>2</sup>, <sup>1</sup>*The University of Alabama*, <sup>2</sup>*Ronald D. Hood & Associates, USA*
- NBTS34. Neonatal NMDA receptor antagonist treatment has no effects on prepulse inhibition (PPI) in postnatal day (PND) 25 Sprague–Dawley rats. Sherin Boctor<sup>1,2</sup>, Natalya Sadvovova<sup>3</sup>, Cheng Wang<sup>1,2</sup>, Sherry Ferguson<sup>1,2</sup>, <sup>1</sup>*Department of Interdisciplinary Biomedical Sciences, University of Arkansas for Medical Sciences*, <sup>2</sup>*Division of Neurotoxicology, National Center for Toxicological Research/FDA*, <sup>3</sup>*Toxicologic Pathology Associates, USA*
- NBTS35. The maturation of the inborn reflexes in C3H/SnY and 101/HY mice during early postnatal ontogenesis after maternal gamma-irradiation before pregnancy. Irina Lilp<sup>1</sup>, F Magkoeva<sup>1</sup>, T Beskova<sup>2,1</sup>, Inga Poletaeva<sup>3</sup>, A Malashenko<sup>2</sup>, <sup>1</sup>*Research Center for Medical Genetics of Russian Academy of Medical Sciences, Russian Federation*, <sup>2</sup>*Research Center for Biomedical Technologies of RAMS, Russian Federation*, <sup>3</sup>*Moscow State University, Moscow, Russian Federation*
- NBTS36. Acoustic startle behavior is moderately altered by lifetime acrylamide (ACR) treatment in rats. Merle Paule, Melody Smith, Joan Garey, Sherry Ferguson, *US FDA's National Center for Toxicological Research, USA*
- NBTS37. The effect of lifelong acrylamide exposure on auditory discrimination task performance in Fischer 344 rats. Joan Garey, Merle Paule, *Division of Neurotoxicology, National Center for Toxicological Research/FDA, USA*
- NBTS38. The effects of oral administration of methylphenidate on activity, emotion and attention in juvenile rats. Ning Zhu, Diana Dow–Edwards, *SUNY Downstate Medial Center, USA*
- NBTS39. The interaction of age, sex, peer influence, and ethanol impacts measures of anxiety in mice. Brian Kelley, John Doyon, Julia Sirpoli, Curtis Bradley, Buddy Swick, Kathryn Taylor, Mackenzie Grimes, Ashley Reid, *Bridgewater College, USA*
- NBTS40. Comparison of training procedures for self-administration of cocaine in female rats. Cindy Roegge, Amanda Evans, Melissa Beck, Philip Atterson, Don Stump, Mark Nemec, Joseph Holson, *WIL Research Laboratories, LLC, USA*
- 1:30–3:15 p.m. Platform 1 Joint Session NBTS/TS – Regency Room 4  
CNS and Prenatal Exposures: Teratological and Neurodevelopmental Outcomes  
Chair – Charles Vorhees, Jane Adams
- 1:30–1:45 p.m. NBTS41. Incidence of major malformations in infants following antidepressant exposure in pregnancy: results of a large cohort study. Adrienne Einarson, Jacquelyn Choi, Gideon Koren, *Hospital for Sick Children, Canada*

- 1:45–2:00 p.m. NBTS42. Antiepileptic drugs as cognitive teratogens: a prospective study of creativity in children exposed to valproate, carbamazepine, and lamotrigine monotherapy, Kelly Marie McVearry<sup>1</sup>, Kimford Meador<sup>2</sup>,<sup>1</sup>*Georgetown University Department of Neurology*,<sup>2</sup>*University of Florida McKnight Brain Institute, USA*
- 2:00–2:15 p.m. NBTS43. Intrauterine growth during different time windows in relation to mental development at 13 months postpartum. OS von Ehrenstein, RT Mikolajczyk, J Zhang, *National Institute Child Health and Human Development, NIH, USA*
- 2:15–2:30 p.m. NBTS44. Low-level prenatal exposure to tobacco smoke and newborn neurobehavior. Kimberly Yolton<sup>1</sup>, Jane Khoury<sup>1</sup>, Yingying Xu<sup>1</sup>, Bruce Lanphear<sup>1</sup>, Paul Succop<sup>2</sup>, Barry Lester<sup>3</sup>,<sup>1</sup>*Cincinnati Children's Hospital Medical Center*,<sup>2</sup>*University of Cincinnati*,<sup>3</sup>*Brown University, USA*
- 2:30–2:45 p.m. NBTS45. Binge ethanol exposure over postnatal days 4–9 and 7–9 produces deficits in trace and long-delay eyeblink conditioning in the rat. Nathen Murawski, Michael Burman, Kevin Brown, Mark Stanton, *University of Delaware, USA*
- 2:45–3:00 p.m. NBTS46. Prenatal Exposure to Cocaine Alters Neurobehavioral Developmental Milestones in Rats. S.S. Handu<sup>1,2</sup>, H. Datta<sup>2</sup>, A. Sankaranarayanan<sup>2</sup>, H. James<sup>1</sup>, K.A.J. Khaja<sup>1</sup>, R.P. Sequeira<sup>1</sup>,<sup>1</sup>*Arabian Gulf University, Bahrain*,<sup>2</sup>*Institute of Medical Education and Research, India*
- 3:00–3:15 p.m. NBTS47. Intravenous cocaine administration throughout pregnancy in the rat: preliminary results. Diana Dow-Edwards, Ning Zhao, Anna Jozwicka, *State Univ. New York, United States*
- 3:15–3:30 p.m. Break (Joint with Teratology) Regency Rooms 4–6 Foyer
- 3:30–5:30 p.m. NBTS Business Meeting – Regency Room 4–6

### Wednesday, July 2, 2008

- 8:30–10:45 a.m. NBTS Platform Session 2 – Regency Rooms 4–6  
Dopamine Signaling: Drugs of Abuse and Environmental Contaminants  
Chair: Gregg Stanwood
- 8:30–8:45 a.m. NBTS48. Biochemical consequences of altered dopamine D1 receptor signaling in the brain. Joshua Parlamen, Gregg Stanwood, *Vanderbilt University, USA*
- 8:45–9:00 a.m. NBTS49. Differential neurochemical consequences of an escalating dose-binge regimen followed by single-day multiple-dose methamphetamine challenges. Devon Graham<sup>1</sup>, Pierre Noailles<sup>2</sup>, Jean Cadet<sup>2</sup>,<sup>1</sup>*Cincinnati Children's Research Foundation*,<sup>2</sup>*DHHS/NIH/NIDA/IRP, USA*
- 9:00–9:15 a.m. NBTS50. Prenatal cocaine differentially alters dopamine D1 and D2 receptor expression in aging rats. Sonya Sobrian, Jharna Das, Jewel Wright, Nailah Adams, Elizabeth Fryer, *Howard University College of Medicine, USA*
- 9:15–9:30 a.m. NBTS51. Acute developmental exposure to polybrominated diphenyl ether 47 (PBDE 47) alters dopamine concentration within the brain of male mice. Jillian Gee<sup>1,2</sup>, Virginia Moser<sup>1</sup>, Kathy McDaniel<sup>1</sup>, David Herr<sup>1</sup>,<sup>1</sup>*Neurotoxicology Division, US EPA*,<sup>2</sup>*North Carolina State University, USA*
- 9:30–9:45 a.m. Break Regency Foyer
- 9:45–10:00 a.m. NBTS52. Low-dose postnatal DE-71 exposure affects learning but not attention in rats. Lori Driscoll, *Colorado College, USA*
- 10:00–10:15 a.m. NBTS53. Selective vulnerability of dopaminergic systems to manganese: relevance to occupational exposure. Jeannette Stankowski, Duncan Leitch, Michael Aschner, BethAnn McLaughlin, Gregg D. Stanwood, *Vanderbilt University Medical Center, USA*
- 10:15–10:30 a.m. NBTS54. Developmental manganese exposures produce neurobehavioral deficits associated with altered dopamine receptor/transporter expression. Cynthia Kern, Donald Smith, *University of California, Santa Cruz, USA*
- 10:30–10:45 a.m. NBTS55. Developing a child-specific reference dose for manganese for use in school site risk assessment. David Chan, *Office of Environmental Health Hazard Assessment, USA*
- 10:45 a.m. NBTS 2008 Meeting Adjourned