



28th annual meeting of the Neurobehavioral Teratology Society in conjunction with the 44th annual meeting of the Teratology Society

The Hyatt Regency Vancouver,
British Columbia
June 26–30, 2004

PROGRAM

Saturday, June 26, 2004

- 2:00 p.m.–5:00 p.m. NBTS Registration
PLAZA A&B
- 3:00 p.m.–4:30 p.m. NBTS Publications Committee Meeting
CONSTABLE ROOM
- 3:00 p.m.–4:00 p.m. NBTS Public Affairs Committee Meeting
BRIGHTON ROOM
- 5:00 p.m.–8:00 p.m. NBTS Council Meeting
BRIGHTON ROOM

Sunday, June 27, 2004

- 8:30 a.m.–5:00 p.m. NBTS Registration
PLAZA A&B
- 9:00 a.m.–12:10 p.m. **NBTS Symposium. Neuroimaging of prenatal drug exposure**
Diana Dow-Edwards, Organizer and Chair
PLAZA A&B
- 9:00 a.m.–9:05 a.m. **Introduction.** DIANA DOW-EDWARDS, SUNY, New York, NY.
- 9:05 a.m.–9:35 a.m. **NBTS 1. Drug exposure in the womb: PET and MRI imaging of drug transfer in pregnant nonhuman primates.** H. BENVENISTE, J.S. FOWLER, J. COPELAND and N. VOLKOW, Brookhaven National Laboratory, Upton, NY, NIAAA, Bethesda, MD.
- 9:35 a.m.–10:05 a.m. **NBTS 2. Neuroimaging with aMRI/MRSI in prenatally cocaine-exposed children.** E.S. BANDSTRA, V. GOVINDARAJU, B.C. BOWEN, C.M. LEONARD, V. MOODLEY, C.E. MORROW and A.A. MAUDSLEY, University of Miami School of Medicine, Miami, FL, University of Florida, Gainesville, FL.
- 10:05 a.m.–10:35 a.m. **NBTS 3. MRI of prenatally cocaine-exposed children: 7–8 years.** L.T. SINGER, J. LEWIN, S. MINNES, P. WEISHAMPEL, D. BOLL, A. ZIJDENBOX, T. PAUS and A. EVANS, Case Western Reserve University, Cleveland, OH, University of Ulm, Ulm, Germany, Neuralyse, Montreal, Canada, Montreal Neurological Institute, Montreal, Canada.

- 10:35 a.m.–10:50 a.m. Break
- 10:50 a.m.–11:20 a.m. **NBTS 4. Neuroimaging findings in prenatally cocaine-exposed children.** M. BEHNKE and F.D. EYLER, University of Florida College of Medicine, Gainesville, FL.
- 11:20 a.m.–11:50 p.m. **NBTS 5. Effects of marijuana exposure on the human fetal brain: Molecular imaging studies.** Y.L. HURD, X. WANG, V. ANDERSON, D. ASHTON, H. MINKOFF and D. DOW-EDWARDS, Karolinska Institute, Stockholm, Sweden, SUNY Downstate, Brooklyn, NY.
- 11:50 p.m.–12:10 p.m. **Discussion,** LAURENCE STANFORD, National Institute on Drug Abuse, Bethesda, MD.
- 12:10 p.m.–2:00 p.m. Lunch
- 2:00 p.m.–4:00 p.m. **NBTS and the Fetal Alcohol Syndrome Study Group of the Research Society on Alcoholism (RSA) Joint Symposium. Is adolescence special? Possible age-related vulnerabilities to chronic alcohol or nicotine exposure**
Susan Barron and Linda P. Spear, Organizers and Co-Chairs
WESTIN BAYSHORE RESORT HOTEL (walking distance from the Hyatt Regency, map to be provided, room to be announced)
- 2:00 p.m.–2:10 p.m. **Introduction.** SUSAN BARRON, University of Kentucky, Lexington, KY.
- 2:10 p.m.–2:30 p.m. **NBTS 6. Alcohol exposure during adolescence affects vulnerability to alcohol-induced impairments during adulthood.** A. WHITE and H.S. SWARTZWELDER, Duke University Medical School, Durham, NC, Durham VA Medical Center, Durham, NC.
- 2:30 p.m.–2:50 p.m. **NBTS 7. Ethanol consumption during adolescence and its long-term consequences.** R. BELL, Z.A. RODD, A.E. SAHR, J.M. MURPHY and W.J. MCBRIDE, Indiana University Medical Center, Indianapolis, IN.
- 2:50 p.m.–3:20 p.m. **NBTS 8. Chronic alcohol or nicotine effects in adolescent rat models.** C.J. SLAWECKI and C.L. EHLERS, The Scripps Research Institute, La Jolla, CA.
- 3:20 p.m.–3:40 p.m. **NBTS 9. Adolescent rats show differential effects of nicotine and alcohol relative to adults.** E.D. LEVIN and A.H. REZVANI, Duke University Medical Center, Durham, NC.
- 3:40 p.m.–4:00 p.m. **Discussion.** LINDA P. SPEAR, SUNY Binghamton, Binghamton, NY.
- 6:15 p.m.–7:45 p.m. **Welcoming Reception (TS/NBTS/OTIS) and Exhibits Open**
REGENCY BALLROOM

Monday, June 28, 2004

- 9:00 a.m.–4:00 p.m. NBTS Registration
PLAZA A&B
- 8:00 a.m.–9:00 a.m. **The Josef Warkany Lecture**
Carl L. Keen, University of California, Davis, CA.
REGENCY E&F
- 9:00 a.m.–9:45 a.m. **The James G. Wilson Publication Award Presentation and Address**
REGENCY E&F
- 9:45 a.m.–10:00 a.m. Break

- 10:00 a.m.–11:45 a.m. **NBTS Platform Session I**
PLAZA A&B
Chair—Joe Tizzano
- Travel Award Recipient**
- 10:00 a.m.–10:20 a.m. **NBTS 10. Behavioral toxicology of MDMA in adolescent rats.** B.J. PIPER, J.B. FRAIMAN and J.S. MEYER, University of Massachusetts, Amherst, MA.
- 10:20 a.m.–10:50 a.m. **NBTS 11. Morpholino modeling of chlorpyrifos-induced learning deficits in zebrafish.** E.D. LEVIN, R.H. ALI, S.D.L. UPCHURCH and E. LINNEY, Duke University Medical Center, Durham, NC.
- 10:50 a.m.–11:10 a.m. **NBTS 12. Prenatal opioid exposure affects neuronal myelination.** S.E. ROBINSON, C. SATO-BIGBEE and J.W. BIGBEE, Virginia Commonwealth University, Richmond, VI.
- 11:10 a.m.–12:10 p.m. **NBTS Business Meeting**
PLAZA A&B
- 12:10 p.m.–1:30 p.m. Lunch
- 1:30 p.m.–3:45 p.m. **NBTS Platform Session II**
PLAZA A&B
Chair—Mary Jeanne Kallman
- 1:30 p.m.–1:50 p.m. **NBTS 13. The effects of prenatal tobacco exposure on neuropsychological outcomes in 14-year-olds.** J.A. WILLFORD and N.L. DAY, University of Pittsburgh, Pittsburgh, PA.
- 1:50 p.m.–2:10 p.m. **NBTS 14. Elevated motor activity in young GDNF \pm and wild-type mice prenatally exposed to the endotoxin, lipopolysaccharide: A preliminary report.** L.D. MIDDAGH, H.A. BOGER, V. ZAMAN and A. CH. GRANHOLM-BENTLY, Medical University of South Carolina, Charleston, SC.
- 2:10 p.m.–2:30 p.m. **NBTS 15. Reversal of neurobehavioral teratogenicity by nicotine therapy: A mouse model.** J. YANAI, A. BEER, F.J. SEIDLER and T.A. SLOTKIN, Hebrew University-Hadassah Medical School, Jerusalem, Israel, Duke Medical Center, Durham, NC.
- 2:30 p.m.–2:45 p.m. Break
- 2:45 p.m.–3:05 p.m. **NBTS 16. Impaired sustained attention and error-induced stereotypy in the Ts65Dn mouse model of Down syndrome (DS).** B.J. STRUPP, L. DRISCOLL, J.-S. MOON, J. CARROLL, M. STRAWDERMAN and L.S. CRNIC, Cornell University, Ithaca, NY, University of Colorado Medical School, Denver, CO.
- Travel Award Recipient**
- 3:05 p.m.–3:25 p.m. **NBTS 17. Could resources devoted to basic perceptual processing impact higher order memory functioning in iron deficient infants? An event-related potential study.** M.J. BURDEN, R. ARMONY-SIVAN, S.W. JACOBSON, J.L. JACOBSON, B. LOZOFF, A. WESTERLUND and C.A. NELSON, Wayne State University, Detroit, MI, University of Michigan, Ann Arbor, MI, University of Minnesota, Minneapolis, MN.
- 3:25 p.m.–3:45 p.m. **NBTS 18. Ethical, legal, and social implications of neurobehavioral teratology.** S.G. GILBERT, Institute of Neurotoxicology and Neurological Disorders, Seattle, WA.
- 5:00 p.m.–7:30 p.m. **NBTS/TS/OTIS Poster Session/Mixer I**
REGENCY A–D
Chair—Stacey Germann

NBTS Posters I:

- NBTS 19** **Callosal shape and behavioral deficits in an adolescent–adult FASD sample.**
P.D. SAMPSON, A.P. STREISSGUTH, P.D. CONNOR, H.M. BARR and
F.L. BOOKSTEIN, University of Washington, Seattle, WA, University of Michigan,
Ann Arbor, MI.
- NBTS 20** **Role of estradiol in stress hyperresponsiveness seen in female rats prenatally exposed to ethanol.** F. YAMASHITA, N. LAN, W. YU, L. ELLIS, A.G. HALPERT and
J. WEINBERG, University of British Columbia, Vancouver, BC, Canada.
- NBTS 21** **Developmental alterations in auditory startle responding from weaning to adulthood in rodents.** M.P. SGRO, R.E. BODINE, L.L. MORFORD, V.J. BENAGH, D.L. MODLIN
and M.J. KALLMAN, Lilly Research Laboratories, Greenfield, IN.
- NBTS 22** **Relationships between spatial learning of a dry land maze and the Morris water maze in Sprague–Dawley (SD), Spontaneously Hypertensive (SHR), and Wistar–Kyoto (WKY) rat strains.** S.A. FERGUSON, A. POGGE and T.A. PATTERSON, National Center for
Toxicological Research/FDA, Jefferson, AR.
- NBTS 23** **Interpreting radial eight-arm maze behavior: Sex and housing conditions alter performance.** R.R. HOLSON, New Mexico Tech, Socorro, NM.
- NBTS 24** **The effect of age, sex, and intelligence on Progressive Ratio (PR) responding for money in children.** K.J. BERRY, A. PHILYAW, J.J. CHELONIS, D.J. BLAKE and M.G. PAULE,
University of Arkansas at Little Rock, Little Rock, AR, University of Arkansas for Medical
Sciences-Arkansas Children’s Hospital, Little Rock, AR, National Center for Toxicological
Research/FDA, Jefferson, AR.
- NBTS 25** **Adolescent exposure to methylphenidate alters ethanol reward during adulthood.**
B.M. KELLEY, H.J. SULLIVAN, F.S. BACA-ASHER and B.L. KURMIS. Bridgewater
College, Bridgewater, VI.
- 7:30 p.m.–10:30 p.m. **MARTA/MTA Student Career Event**
CYPRESS ROOM
- Tuesday, June 29, 2004**
- 9:00 a.m.–4:00 p.m. NBTS Registration
PLAZA A&B
- 9:30 a.m.–12:00 p.m. **NBTS/OTIS/TS Joint Symposium. Birth defects and other adverse pregnancy outcomes due to maternal obesity.**
James Mills, Thomas Flynn, Christina Chambers, Organizers
REGENCY E&F
- 9:30 a.m.–9:35 a.m. **Introduction.** THOMAS FLYNN, U.S. FDA
- 9:35 a.m.–10:05 a.m. **Neural tube defects and other birth defects associated with maternal obesity—Risks, ethnic variability, and folic acid prevention.** G. SHAW, California Birth Defects Monitoring
Program
- 10:05 a.m.–10:35 a.m. **Maternal obesity and adverse obstetrical outcome.** J. RAY, University of Toronto.
- 10:35 a.m.–10:50 a.m. Break

- 10:50 a.m.–11:20 a.m. **Causes and prevention of maternal obesity—Genetics, regulation of appetite, suppression of appetite, strategies for weight loss.** D. CUMMINGS, University of Washington.
- 11:20 a.m.–11:50 a.m. **The epidemic of obesity—National and international policy and strategic approaches to prevention.** W. DIETZ, Centers for Disease Control.
- 11:50 a.m.–12:00 noon Closing remarks. J. MILLS, NICHD
- 12:00 noon–1:00 p.m.
- 1:00 p.m.–4:30 p.m. **NBTS/TS Joint Symposium. Neurobehavioral outcomes of common exposures.** Sherry Ferguson, Kenneth Lyon Jones, Organizers.
REGENCY E&F
- 1:00 p.m.–1:10 p.m. **Introduction.** SHERRY FERGUSON, National Center for Toxicological Research/FDA, Jefferson, AR.
- 1:10 p.m.–1:40 p.m. **NBTS 26. The adverse effect profile of neurobehavioral teratogens: Retinoic acid.** J. ADAMS. University of Massachusetts, Boston, MA.
- 1:40 p.m.–2:10 p.m. **NBTS 27. Long-term neurobehavioral effects of prenatal cocaine exposure.** G.A. RICHARDSON, University of Pittsburgh School of Medicine, Pittsburgh, PA.
- 2:10 p.m.–2:40 p.m. **NBTS 28. Evidence linking prenatal PCB exposure to neurobehavioral deficits.** S.W. JACOBSON, Wayne State University School of Medicine, Detroit, MI.
- 2:40 p.m.–3:00 p.m. Break
- 3:00 p.m.–3:30 p.m. **NBTS 29. Neurobehavioral effects of prenatal alcohol exposure.** C.D. COLES, Emory University School of Medicine, Atlanta, GA.
- 3:30 p.m.–4:00 p.m. **NBTS 30. Neurodevelopmental effects of prenatal exposure to fluoxetine.** S.N. MATTSON, San Diego State University, San Diego, CA.
- 4:00 p.m.–4:30 p.m. **NBTS 31. The adverse effect profile of neurobehavioral teratogens: Phenobarbital.** J. ADAMS, L.B. HOLMES and P. JANULEWICZ, University of Massachusetts, Boston, MA, Mass General Hospital, Boston, MA.
- 5:00 p.m.–7:30 p.m. **NBTS/TS/OTIS Poster Session/Mixer II**
REGENCY A–D
Chair—Merle Paule
- NBTS 32** **Moderation of fetal alcohol effects by variation in serotonin transporter gene in monkeys.** M.L. SCHNEIDER, C.F. MOORE, T.K. NEWMAN, C.S. BARR, J.A. LARSON, A. ROBERTS, O.T. DEJESUS and G.W. KRAEMER, University of Wisconsin, Madison, WI.
- NBTS 33** **Assessment of multiple behaviors in adult C57BL/6J mice following binge-like alcohol exposure during the implantation period.** S.E. MAIER, N. ROGERS, C.L. BEHRENDT, D.L. LIVY and J.R. WEST, The Texas A and M University System HSC, College Station, TX.
- NBTS 34** **Prepulse inhibition of auditory startle in 60-day-old rats: System validation with apomorphine.** E.R. FRIZELL, R.M. MANDELLA and K.P. HAZELDEN, Huntingdon Life Sciences/Princeton Research Center, East Millstone, NJ.

- NBTS 35** **Behavioral effects of acrylamide exposure during early development in Fischer 344 rats.** J. GAREY, S.A. FERGUSON and M.G. PAULE, National Center for Toxicological Research/FDA, Jefferson, AR.
- NBTS 36** **Effects of neonatal manganese exposure on impulsivity of adult rats using a DRL task.** C. REICHEL, R. HERNANDEZ-FISH, J. WACAN, J. SIBOLE, A. BUTT, C. CRAWFORD and S. MCDUGALL, California State University, San Bernardino, CA.
- NBTS 37** **Evaluation of postnatal developmental neurotoxicity (DNT) of *p*-menthane 3,8 diol following dermal administration in rats.** J.F. BARNETT, Jr., D.B. LEARN, A.M. HOBERMAN, U. VEDULA and T.G. OSIMITZ, Charles River Discovery and Development Services, Argus Division, Horsham, PA, S.C. Johnson and Sons, Inc., Racine, WI, Science Strategies, LLC., Charlottesville, VI.
- NBTS 38** **Early behavioral evaluation in monkey infants fed soy formula with or without added manganese (Mn).** M.S. GOLUB, S.L. GERMANN, T. TRAN, C.E. HOGREFE, F.M. CRINELLA and B. LONNERDAL, University of California, Davis, CA, University of California, Irvine, CA.
- NBTS 39** **Neurobehavioral assessment of paraoxonase (PON1) knockout mice exposed postnatally to chlorpyrifos oxon.** B.J. WALTER, T.B. COLE, J.C. FISHER, C. PETTAN-BREWER, T.M. BURBACHER, C.E. FURLONG and L.G. COSTA, University of Washington, Seattle, WA.

Wednesday, June 30, 2004

- 8:30 a.m.–12:00 p.m. **NBTS Platform Presentations III**
PLAZA A&B
Chair—Jack Lipton
- 8:30 a.m.–8:35 a.m. **Introduction** of New Investigator Award Recipient—Jack Lipton
- 8:35 a.m.–9:05 a.m. **New Investigator Award Recipient**
NBTS 40. Prenatal MDMA exposure increases axonal guidance cues, reduces monoamine metabolism, increases forebrain tyrosine hydroxylase fiber density and alters exploratory behaviors in rats. J. B. KOPRICH, L. LIN, C-Y. CHUNG, O. ISACSON, E.Y. CHEN, N.M. KANAAN, N.G. CAMPBELL, M. CHU and J.W. LIPTON, Rush University Medical Center, Chicago, IL, Harvard Medical School, Boston, MA.
- 9:05 a.m.–9:25 a.m. **Travel Award Recipient**
NBTS 41. Prenatal cocaine decreases the behavioral response to methylphenidate in adolescent female rats. A. TORRES-REVERON and D.L. DOW-EDWARDS, SUNY Downstate, Brooklyn, NY.
- 9:25 a.m.–9:45 a.m. **NBTS 42. Cocaine-induced changes in expression of apoptosis-related genes in the fetal mouse cerebral cortex.** S.I. NOVIKOVA, J. BAI and M.S. LIDOW, University of Maryland, Baltimore, MD.
- 9:45 a.m.–10:05 a.m. **NBTS 43. Application of an adaptation of neonatal behavioral assessment scale to rhesus monkeys exposed to cocaine in utero.** M.S. LIDOW, N. HE, M-B. CHAMPOUX and S. SUOMI, University of Maryland, Baltimore, MD.
- 10:05 a.m.–10:20 a.m. Break

- 10:20 a.m.–10:40 a.m. **NBTS 44. Event related potentials in cocaine-exposed children.** L.C. MAYES, D. MOLFESE and A.F. KEY, Yale Child Study Center, New Haven, CT, University of Louisville, Louisville, KY.
- 10:40 a.m.–11:00 a.m. **NBTS 45. Impaired performance of children exposed in utero to cocaine on a novel test of visuospatial working memory.** N. HUNTER, E. LANGLOIS, P.J. SNYDER, I. SIELSKI and L.C. MAYES. Yale Child Study Center, New Haven, CT, Pfizer Global Research and Development, Groton, CT.
- 11:00 a.m.–11:20 a.m. **NBTS 46. Prenatal cocaine and/or nicotine exposure fails to disrupt nonspatial, short-term memory in senescent offspring.** S.K. SOBRIAN, E. CLARK, Jr., J.K. ARGUINZONI and T. NORWOOD, Howard University College of Medicine, Washington, DC.