

THE
TERATOLOGY
SOCIETY
BIRTH DEFECTS RESEARCH • EDUCATION • PREVENTION
EST. 1960

44th Annual Meeting
June 26-July 1, 2004
Vancouver

**28th Annual Meeting of the
Neurobehavioral Teratology Society
(NBTS)**

June 26-30, 2004

and the

**17th International Conference of the
Organization of Teratology
Information Services (OTIS)**

June 25-28, 2004

Hyatt Regency Vancouver

*Vancouver, British Columbia
Canada*

Program and Abstracts

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*44th Annual
Meeting*

June 26-July 1, 2004



44th Annual Meeting

Program Overview

Saturday, June 26

9:00 AM – 12:00 PM
Council 1A Meeting
11:30 AM – 5:00 PM
Registration
1:00 PM – 4:30 PM
Education Course
5:00 PM – 9:00 PM
Council 1B Meeting

Sunday, June 27

8:00 AM – 5:00 PM
Registration
8:15 AM – 11:30 AM
Education Course
1:00 PM – 4:00 PM
March of Dimes Symposium
4:15 PM – 6:00 PM
Maternal-Fetal Medicine
6:00 PM – 6:15 PM
National Children's Study Update
6:15 PM – 7:45 PM
Welcoming Reception and Exhibits Open

Monday, June 28

7:00 AM – 8:15 AM
BDR-B Editorial Meeting
8:00 AM – 5:00 PM
Registration
8:00 AM – 8:10 AM
President's Welcome
8:10 AM – 9:00 AM
The Josef Warkany Lecture
9:00 AM – 9:45 AM
Wilson Publication Award Presentation and Address
10:00 AM – 11:00 AM
Special Lecture
Fetal Determinants of Long Term Health
11:00 AM – 12:30 PM
Student Plenary Session

12:30 PM – 7:30 PM
Posters and Exhibits Open

1:00 PM – 4:00 PM
Teratogen Update

1:00 PM – 4:00 PM
Computational Systems Biology and Implications for Developmental Toxicology: From Molecules to Systems

4:00 PM – 5:00 PM
Issues Forum/Editor Reports

5:00 PM – 7:30 PM
Joint TS/NBTS/OTIS
Poster Session I

7:30 PM – 10:30 PM
MARTA/MTA Student Career Event

Tuesday, June 29

7:00 AM – 8:15 AM
BDR-A Editorial Meeting

8:00 AM – 5:00 PM
Registration

8:00 AM – 9:30 AM
Mini Course

9:30 AM – 12:00 PM
Public Affairs Committee Symposium (NBTS/TS Joint Symposium) Birth Defects and Other Adverse Pregnancy Outcomes Due to Maternal Obesity

12:00 PM – 1:00 PM
2005 Program Committee Meeting

12:30 PM – 7:30 PM
Posters and Exhibits Open

1:00 PM – 4:30 PM
NBTS/TS Joint Symposium—Neurobehavioral Outcomes of Common Exposures

1:00 PM – 4:30 PM
Pharmacokinetics and Metabolism in Pregnancy and Lactation—Consideration for Maternal Therapy and Fetal and Neonatal Risk

5:00 PM – 7:30 PM
Joint TS/NBTS Poster Session II

Wednesday, June 30

7:00 AM – 8:00 AM
Public Affairs Committee Meeting

7:00 AM – 8:00 AM
Publications Committee Meeting

8:00 AM – 5:00 PM
Registration

8:30 AM – 11:45 AM
SPER/TS Joint Symposium—Epidemiology of Miscarriage

11:45 PM – 1:15 PM
Past Presidents' Luncheon (By invitation only)

1:00 PM – 5:00 PM
Platform Session I—Mechanisms of Abnormal Development

1:00 PM – 5:00 PM
Platform Session II—Clinical Teratology and Epidemiology

1:00 PM – 5:00 PM
Platform Session III—Genomics/Molecular Biology

5:00 PM – 6:00 PM
Business Meeting

7:00 PM – 8:00 PM
Banquet Reception

8:00 PM
Wilson and Fraser Banquet

Thursday, July 1

7:30 AM – 8:00 AM
Registration and Continental Breakfast

8:00 AM – 11:00 AM
Wiley-Liss Symposium
The Role of Neural Crest Cells

12:00 PM – 4:00 PM
Council II Meeting

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44th Annual Meeting

Program Agenda

Saturday, June 26

- 9:00 AM – 12:00 PM **COUNCIL 1A MEETING**—Prince of Wales Room
- 11:30 AM – 5:00 PM **REGISTRATION**—Regency Foyer
- 1:00 PM – 4:30 PM **EDUCATION COURSE**—Regency Ballroom E-F
PART 1: Signaling Pathways and Tissue Interactions in Organ-System Development
Organized by the Education Committee; Michael G. Narotsky, Chairperson
Sponsored by DuPont Haskell Laboratory and Endo Pharmaceuticals, Inc.
Coursebooks provided by CTBR
- 1:00 PM – 1:10 PM **Welcome – Rochelle W. Tyl, President, Teratology Society**
- 1:10 PM – 1:15 PM **Introduction**
Speaker: Michael G. Narotsky, U.S. EPA
- 1:15 PM – 2:00 PM **Overview of Signaling and Development**
Speaker: Henk Roelink, University of Washington
- 2:00 PM – 2:45 PM **Patterning**
Speaker: Claudia Kappen, University of Nebraska Medical Center
- 2:45 PM – 3:00 PM **Break**
- 3:00 PM – 3:45 PM **Cellular, Molecular and Genetic Approaches to Study Cell Migration *In Vivo***
Speaker: Vanessa Auld, University of British Columbia
- 3:45 PM – 4:30 PM **Signaling and Tissue Interactions in Morphogenesis**
Speaker: Barbara Abbott, U.S. EPA
- 5:00 PM – 9:00 PM **COUNCIL 1B MEETING (Committee Reports)**—Prince of Wales Room

Sunday, June 27

- 7:30 AM – 8:15 PM **EDUCATION COURSE CONTINENTAL BREAKFAST**—Regency Foyer
- 8:00 AM – 5:00 PM **REGISTRATION**—Regency Foyer
- 8:15 AM – 11:30 AM **EDUCATION COURSE (Continued from Saturday)**—Regency Ballroom E–F
PART 2: Signaling Pathways and Tissue Interactions in Organ-System Development
- 8:15 AM – 9:00 AM **Development of Bone and Cartilage**
Speaker: Rocky Tuan, NIH/NIAMS
- 9:00 AM – 9:45 AM **Heart Development**
Speaker: Ida Smoak, North Carolina State University
- 9:45 AM – 10:00 AM Break**
- 10:00 AM – 10:45 AM **Patterning of the Gastrointestinal Tract and Derivatives**
Speaker: Drucilla Jane Roberts, Harvard Medical School
- 10:45 AM – 11:30 AM **Signaling in Genitourinary Development**
Speaker: H. Scott Stadler, Oregon Health Sciences University
- 1:00 PM – 4:00 PM **MARCH OF DIMES SYMPOSIUM**—Regency Ballroom E–F
RNA Interference (RNAi) Approaches to the Study of Normal and Abnormal Development
Organized by Philip E. Mirkes, University of Washington; Jan Friedman, University of British Columbia, Vancouver; and Richard Finnell, Texas A&M University System Health Science Center
Sponsored by March of Dimes Birth Defects Foundation Grant No. 4-FY03-138
- 1:00 PM – 1:05 PM **Introduction**
Speaker: Philip E. Mirkes, University of Washington
- 1:05 PM – 1:40 PM S1 **Enabling Developments in siRNA-Mediated Gene Silencing**
Speaker: Steve Daniel, Dharmacon RNA Technologies, Inc.
- 1:40 PM – 2:20 PM S2 **RNAi in C. Elegans**
Speaker: TBA
- 2:20 PM – 2:40 PM Break**
- 2:40 PM – 3:20 PM S3 **MicroRNA Regulators of Cell Death in Development**
Speaker: Bruce Hay, California Institute of Technology
- 3:20 PM – 4:00 PM S4 **Mus Musculus, RNAi and Development**
Speaker: Janet Rossant, Samuel Lunenfeld Research Institute

Sunday, June 27 (continued)

4:15 PM – 6:00 PM **MATERNAL-FETAL MEDICINE**—Regency Ballroom E-F

Teratogenic Implication of Maternal Disease and its Treatment

This session will address from the perinatologist's perspective, two common maternal conditions that may have significant impact on fetal development. The presentations will focus on the affect on fetal development of treatment of the maternal disease as well as the disease itself.

Moderator: Andy Hull, University of California, San Diego

4:15 PM – 4:25 PM

Introduction

Speaker: Andy Hull, University of California, San Diego

4:25 PM – 5:05 PM

S5 **Maternal Diabetes**

Speaker: Tom Moore, University of California, San Diego

5:05 PM – 5:45 PM

S6 **Hypertensive Disorders and Pregnancy**

Speaker: John Kingdom, Mount Sinai Hospital

5:45 PM – 6:00 PM

Discussion

6:00 PM – 6:15 PM **NATIONAL CHILDREN'S STUDY UPDATE**

Speaker: Donald Mattison, NICHD

6:15 PM – 7:45 PM **WELCOMING RECEPTION AND EXHIBITS OPEN**—Regency Ballroom A-D

Sponsored by Bristol-Myers Squibb, MPI Research and RTI International

Monday, June 28

7:00 AM – 8:15 AM **BDR-B EDITORIAL MEETING**—Tennyson Room

8:00 AM – 5:00 PM **REGISTRATION**—Regency Foyer

8:00 AM – 8:10 AM **PRESIDENT'S WELCOME**—**Rochelle W. Tyl**—Regency Ballroom E-F

8:10 AM – 9:00 AM **THE JOSEF WARKANY LECTURE**—Regency Ballroom E-F

Speaker: Carl L. Keen, University of California, Davis

9:00 AM – 9:45 AM **THE JAMES G. WILSON PUBLICATION AWARD PRESENTATION AND ADDRESS**—Regency Ballroom E-F

Neural and Orofacial Defects in Folbp 1 Knockout Mice

Speaker: Richard H. Finnell, Texas A&M University System Health Science Center

10:00 AM – 11:00 AM **SPECIAL LECTURE**—Regency Ballroom E-F

Fetal Determinants of Long Term Health

Speaker: Judith Hall, University of British Columbia, Vancouver

11:00 AM – 12:30 PM **STUDENT PLENARY SESSION**—Regency Ballroom E-F

11:00 AM – 11:15 AM

1 **The Effect of β_2 -agonists and Inhaled Corticosteroids Used to Treat Asthma in Pregnancy on Fetal Growth.**

L.N. Bakhireva, K.L. Jones, D.L. Johnson, G.R. Macaraeg, C.D. Chambers. Department of Pediatrics, University of California, San Diego, La Jolla, CA, United States.

Monday, June 28 (continued)

- 11:15 AM – 11:30 AM 2 **Cellular Anomalies Underlying Retinoid-Induced Phocomelia.**
J. Zhou, D.M. Kochhar. Department of Pathology, Anatomy and Cell Biology, Thomas Jefferson University, Philadelphia, PA, United States.
- 11:30 AM – 11:45 AM 3 **Evidence of Increased Birth Defects in the Offspring of Women Exposed to Valproate during Pregnancy: Findings from the AED Pregnancy Registry.**
R.M. Alsdorff, D.F. Wyszynski¹, L.B. Holmes², M. Nambisan³. ¹Boston University School of Medicine, Department of Medicine, Boston, MA, United States, ²Massachusetts General Hospital, Pediatric Service, Boston, MA, United States, ³Harvard Medical School, Department of Pediatrics, Boston, MA, United States.
- 11:45 AM – 12:00 PM 4 **Teratogen Update: Potential Risks of Angiotensin II Receptor Antagonists during Pregnancy.**
S. Alwan¹, J.E. Polifka², J.M. Friedman¹. ¹Department of Medical Genetics, University of British Columbia, Vancouver, British Columbia, Canada, ²Department of Pediatrics, University of Washington, Seattle, Washington, United States.
- 12:00 PM – 12:15 PM 5 **The Role of Retinoic Acid Receptors Alpha 1 and Gamma in Retinoid-Induced Limb Dymorphogenesis.**
E. Galdones¹, D. Lohnes², B.F. Hales¹. ¹McGill University, Department of Pharmacology & Therapeutics, Montreal, QC, Canada, ²Institut de Recherches Cliniques de Montreal, Montreal, QC, Canada.
- 12:15 PM – 12:30 PM 6 **Activator Protein 1 (AP-1) DNA Binding Activity Is Induced in the Mouse Embryo during Organogenesis by Hydroxyurea (HU).**
J. Yan, B.F. Hales. McGill University, Department of Pharmacology & Therapeutics, Montreal, QC, Canada.
- 12:30 PM – 7:30 PM **POSTERS AND EXHIBITS OPEN**—Regency Ballroom A–D
- 1:00 PM – 4:00 PM **CONCURRENT SYMPOSIUM I (TS/OTIS Joint Symposium)**—Regency Ballroom E–F
- Teratogen Update**
Organized by Robert Brent, Alfred I. duPont Hospital for Children
- 1:00 PM – 1:05 PM **Introduction**
Speaker: Robert Brent, Alfred I. duPont Hospital for Children
- 1:05 PM – 1:35 PM S7 **Genetic Polymorphisms: Impact on the Risk of FAS**
Speaker: Ting-Kai Li, National Institute on Alcohol Abuse and Alcoholism

Monday, June 28 (continued)

- 1:35 PM – 2:05 PM S8 **Update on the Risk of New Anticonvulsants**
Speaker: Lewis B. Holmes, Massachusetts General Hospital for Children
- 2:05 PM – 2:35 PM S9 **Pesticides: The Risk of Birth Defects and Cancer**
Speaker: Rochelle W. Tyl, RTI International
- 2:35 PM – 2:50 PM Break**
- 2:50 PM – 3:20 PM S10 **Trimethoprim Teratogenicity**
Speaker: Sonia Hernandez-Diaz, Slone Epidemiology Center, Boston University
- 3:20 PM – 3:50 PM S11 **Trichloroethylene (TCE) and Cardiac Teratogenicity**
Speaker: Robert Brent, Alfred I. duPont Hospital for Children
- 3:50 PM – 4:00 PM Discussion
- 1:00 PM – 4:00 PM **CONCURRENT SYMPOSIUM II**—Balmoral Room
Computational Systems Biology and Implications for Developmental Toxicology: From Molecules to Systems
Organized by Robert Kavlock and Elaine Francis, U.S. EPA
Sponsored by U.S. EPA
- 1:00 PM – 1:10 PM Introduction
Speaker: Robert Kavlock, U.S. EPA
- 1:10 PM – 1:40 PM S12 **Computational Approaches for Predicting the Toxicological Effects of Xenobiotic Chemicals**
Speaker: William J. Welsh, RW Johnson Medical School
- 1:40 PM – 2:10 PM S13 **Towards Understanding Development: Building a Model of the Early Sea Urchin Embryo**
Speaker: C. Titus Brown, California Institute of Technology
- 2:10 PM – 2:40 PM S14 **Understanding Pathways of Toxicity: Making Sense of Changing Signals**
Speaker: Sid Hunter, U.S. EPA
- 2:40 PM – 3:00 PM Break**
- 3:00 PM – 3:30 PM S15 **Network Models of EGF Receptor Signaling during Cell Organization and Differentiation**
Speaker: H. Steven Wiley, Pacific Northwest National Laboratory
- 3:30 PM – 4:00 PM S16 **Birth Defects Systems Manager and Teratology Analyzer: A Beginning**
Speaker: Thomas Knudsen, University of Louisville
- 4:00 PM – 5:00 PM **ISSUES FORUM/EDITOR REPORTS**—Regency Ballroom E–F
- 5:00 PM – 7:30 PM **JOINT TS/NBTS/OTIS POSTER SESSION I**—Regency Ballroom A–D
- 7:30 PM – 10:30 PM **MARTA/MTA STUDENT CAREER EVENT**—Cypress Room

Tuesday, June 29

- 7:00 AM – 8:15 AM **BDR-A EDITORIAL MEETING**—Cavendish Room
- 7:30 AM – 8:00 AM **MINI COURSE ATTENDEE CONTINENTAL BREAKFAST**—Balmoral Room
- 8:00 AM – 5:00 PM **REGISTRATION**—Regency Foyer
- 8:00 AM – 9:30 AM **MINI COURSE (*Separate Registration Required*)**—Balmoral Room
Epidemiology: The Basics
Organized by the Education Committee, Michael G. Narotsky, Chairperson
Coursebooks provided by CTBR
- 8:00 AM – 8:45 AM **Clinical Epidemiology**
Speaker: Christina Chambers, University of California, San Diego
- 8:45 AM – 9:30 AM **Current Issues in Molecular Epidemiology**
Speaker: Andrew Olshan, University of North Carolina
- 9:30 AM – 12:00 PM **PUBLIC AFFAIRS COMMITTEE SYMPOSIUM (NBTS/TS Joint Symposium)**—Regency Ballroom E–F
Birth Defects and Other Adverse Pregnancy Outcomes Due to Maternal Obesity
Organized by James Mills, NICHD; Thomas Flynn, U.S. FDA; and Christina Chambers, University of California, San Diego
Sponsored by the Teratology Society and NBTS
- 9:30 AM – 9:40 AM **Introduction**
Speaker: Thomas Flynn, U.S. FDA
- 9:40 AM – 10:05 AM **Neural Tube Defects & Other Birth Defects Associated with Maternal Obesity—Risks, Ethnic Variability, and Folic Acid Prevention**
Speaker: Gary Shaw, California Birth Defects Monitoring Program
- 10:05 AM – 10:30 AM **Maternal Obesity and Adverse Obstetrical Outcome**
Speaker: Joel Ray, University of Toronto
- 10:30 AM – 10:55 AM Break**
- 10:55 AM – 11:20 AM **Causes and Prevention of Maternal Obesity—Genetics, Regulation of Appetite, Suppression of Appetite, Strategies for Weight Loss**
Speaker: David Cummings, University of Washington
- 11:20 AM – 11:45 AM **The Epidemic of Obesity—National and International Policy and Strategic Approaches to Prevention**
Speaker: William Dietz, Centers for Disease Control
- 11:45 AM – 12:00 PM **Closing Remarks**
Speaker: James Mills, NICHD
- 12:00 PM – 1:00 PM **2005 PROGRAM COMMITTEE MEETING**—Dover Room
- 12:30 PM – 7:30 PM **POSTERS AND EXHIBITS OPEN**—Regency Ballroom A–D

Tuesday, June 29 (continued)

1:00 PM – 4:30 PM

CONCURRENT SYMPOSIUM I (NBTS/TS Joint Symposium)—Regency Ballroom E–F

Neurobehavioral Outcomes of Common Exposures

Organized by Sherry Ferguson, National Center for Toxicological Research, U.S. FDA; and Kenneth Lyons Jones, University of California, San Diego

1:00 PM – 1:10 PM

Introduction

Speaker: Sherry Ferguson, National Center for Toxicological Research, U.S. FDA

1:10 PM – 1:40 PM

S17 **Accutane**

Speaker: Jane Adams, University of Massachusetts

1:40 PM – 2:10 PM

S18 **Cocaine**

Speaker: Gale Richardson, University of Pittsburgh

2:10 PM – 2:40 PM

S19 **PCB**

Speaker: Sandra Jacobson, Wayne State University

2:40 PM – 3:00 PM

Break

3:00 PM – 3:30 PM

S20 **Alcohol**

Speaker: Claire D. Coles, Emory University School of Medicine

3:30 PM – 4:00 PM

S21 **Prozac**

Speaker: Sarah Mattson, San Diego State University

4:00 PM – 4:30 PM

S22 **Phenobarbital**

Speaker: Jane Adams, University of Massachusetts

1:00 PM – 4:30 PM

CONCURRENT SYMPOSIUM II—Balmoral Room

Pharmacokinetics and Metabolism in Pregnancy and Lactation—Consideration for Maternal Therapy and Fetal and Neonatal Risk

Organized by Dana L. Shuey, Endo Pharmaceuticals, Inc.

Sponsored by Middle Atlantic Reproduction and Teratology Association and Midwest Teratology Association

1:00 PM – 1:10 PM

Introduction

Speaker: Dana L. Shuey, Endo Pharmaceuticals, Inc.

1:10 PM – 1:55 PM

S23 **Ontogeny of Human Drug-Metabolism**

Speaker: Ronald Hines, Medical College of Wisconsin

1:55 PM – 2:40 PM

S24 **Metabolism and Drug Transporters in the Placenta**

Speaker: William Slikker, Jr., National Center for Toxicology Research

2:40 PM – 3:00 PM

Break

3:00 PM – 3:45 PM

S25 **Treating the Mother—Protecting the Unborn: Toward Rational Drug Therapy in Pregnancy**

Speaker: Gideon Koren, Hospital for Sick Children

3:45 PM – 4:30 PM

S26 **Transfer of Drugs and Chemicals into Human Milk: Rational Risk Assessment**

Speaker: Shinya Ito, Hospital for Sick Children

Tuesday, June 29 (continued)5:00 PM – 7:30 PM **JOINT TS/NBTS POSTER SESSION II**—Regency Ballroom A–D**Wednesday, June 30**7:00 AM – 8:00 AM **Public Affairs Committee Meeting**—Cavendish Room7:00 AM – 8:00 AM **Publications Committee Meeting**—Dover Room8:00 AM – 5:00 PM **REGISTRATION**—Regency Foyer8:30 AM – 11:45 AM **SPER/TS JOINT SYMPOSIUM**—Regency Ballroom E–F**Epidemiology of Miscarriage**

Goal: Examine the methods and current knowledge regarding the causes of miscarriage derived from epidemiology, with consideration of corresponding toxicology, measurement challenges, and future prospects for improved study.

Organized by Christina Chambers, University of California, San Diego; Martha M. Werler, Slone Epidemiology Center, Boston University; and David A. Savitz, University of North Carolina

8:30 AM – 8:40 AM

Introduction

Speaker: Martha M. Werler, Slone Epidemiology Center, Boston University

8:40 AM – 9:05 AM

S27 **Animal Models for Studying Miscarriage—
Illustration with Study of Drinking Water
Disinfection By-Products**

Speaker: Michael G. Narotsky, U.S. EPA

9:05 AM – 9:30 AM

S28 **Genetic Causes of Miscarriage**

Speaker: Wendy P. Robinson, University of British Columbia

9:30 AM – 10:00 AM

Warkany Tea

10:00 AM – 10:25 AM

S29 **Autoimmune Causes of Miscarriage**

Speaker: Mary Stephenson, University of Chicago

10:25 AM – 10:50 AM

S30 **Epidemiologic Approaches to the Study of Early
Miscarriage**

Speaker: Germaine Buck, NICHD

10:50 AM – 11:15 AM

S31 **Epidemiologic Evidence on Causes of
Miscarriages: Illustration with Ongoing Study of
Drinking Water Disinfection By-Products**

Speaker: David A. Savitz, University of North Carolina

11:15 AM – 11:45 PM

Closing Comments and Discussion

Speaker: Christina Chambers, University of California, San Diego

11:45 PM – 1:15 PM

PAST PRESIDENTS' LUNCHEON (By invitation only)—Seymour Room

Wednesday, June 30 (continued)

1:00 PM – 5:00 PM

CONCURRENT PLATFORM SESSION I

Mechanisms of Abnormal Development—Balmoral Room

- 1:00 PM – 1:15 PM 7 **Laser Capture Microdissection and Gene Array Analysis of Palatal Epithelial and Mesenchymal Cells Exposed to TCDD.**
B.D. Abbott, J.E. Schmid. Repro.Tox.Div., U.S. EPA, Research Triangle Park, NC, United States.
- 1:15 PM – 1:30 PM 8 **Alterations in Biotin-Dependent Carboxylases in Fetal and Maternal Liver Induced by Biotin Deficiency.**
D.K. Hansen¹, S.L. Stratton², W.M. Sealey², D.M. Mock². ¹National Center for Toxicological Research, Division of Genetic and Reproductive Toxicology, Jefferson, AR, United States, ²University of Arkansas for Medical Sciences, Department of Biochemistry and Molecular Biology, Little Rock, AR, United States.
- 1:30 PM – 1:45 PM 9 **The Progressive Effects of Heat Stress on Somitogenesis and Other Developing Tissues in the Rat.**
K.E. Wheeler¹, G.L. Kimmel², T.W. Claggett³, C.A. Kimmel⁴. ¹Orise Fellow U.S. FDA Center for Devices and Radiological Health, Rockville, MD, United States, ²Visiting Scientist, U.S. FDA, Rockville, MD, United States, ³Charles River Laboratories, Frederick, MD, United States, ⁴National Center for Environmental Assessment/ORD, U.S. EPA, Washington, DC, United States.
- 1:45 PM – 2:00 PM 10 **Beneficial Effect of Folate in Two Genetic Models of Aberrant Skeletal Development.**
C. Kappen, C. Kruger, C. Talmadge, J.M. Salbaum. University of Nebraska Medical Center, Department of Genetics, Cell Biology and Anatomy, Omaha, NE, United States.
- 2:00 PM – 2:15 PM 11 **Intra Uterine Growth Restriction: A Unique Experimental Rat Model Combining Genetic and Environmental Causative Factors.**
M. Avgil¹, R.K. Miller², A. Ornoy¹. ¹Hebrew University Hadassah Medical School, Jerusalem, Israel, ²School of Medicine and Dentistry, University of Rochester, Rochester, NY, United States.
- 2:15 PM – 2:30 PM 12 **In Utero and Lactational Exposures to Low Dose PBDE 47 Cause Neurobehavior Disturbances in Rat Offspring.**
S.N. Kuriyama, C.E. Talsness, I. Chahoud. Institute of Clinical Pharmacology and Toxicology, Charoté University Medical School Berlin, Campus Benjamin Franklin, Berlin, Germany.

Wednesday, June 30 (continued)

- 2:30 PM – 2:45 PM 13 **Altered Gene Expression of Mouse Embryo Cultures Exposed to Bromochloroacetic Acid.**
E.D. Karoly¹, J.E. Schmid², M.R. Blanton², E.S. Hunter III¹. ¹University of North Carolina at Chapel Hill, Curriculum in Toxicology, Chapel Hill, NC, United States, ²U.S. EPA, Reproductive Toxicology Division, Research Triangle Park, NC, United States.
- 2:45 PM – 3:00 PM 14 **Phospholipase C Signaling in Ethanol-Induced Apoptosis during Early Embryo Development.**
A. Garic-Stankovic¹, M. Hernandez¹, K.A. Kragtorp-Debelak¹, D.R. Armant², S.M. Smith¹. ¹Department of Nutritional Sciences, University of Wisconsin-Madison, Madison, WI, United States, ²Department of Obstetrics & Gynecology, Wayne State University, Detroit, MI, United States.
- 3:00 PM – 3:15 PM **Break**
- 3:15 PM – 3:30 PM 15 **Cell Death and Developmental Timing Are Critical Determinants of Facial Dysmorphology in the Chick Model of Prenatal Alcohol Exposure.**
K.A. Kragtorp-Debelak, M. Moyers, A. Garic-Stankovic, S.M. Smith. Dept. Nutritional Sciences, University of Wisconsin-Madison, Madison, WI, United States.
- 3:30 PM – 3:45 PM 16 **Fumonisin, Folate, and Neural Tube Defects: Novel Mechanisms Involving TNF α Signaling and Redox Homeostasis.**
J. Gelineau-Van Waes, L. Starr, J. Wilberding, F. Aleman, J. Maddox. Dept. Genetics, Cell Biology & Anatomy, University of Nebraska Medical Center, Omaha, NE, United States.
- 3:45 PM – 4:00 PM 17 **The Role of Hypoxia-Inducible Factor-1 (HIF-1 Alpha) in Mouse Limbs Exposed to 4-Hydroperoxycyclophosphamide *In Vitro*.**
C. Huang, B.F. Hales. McGill University, Department of Pharmacology & Therapeutics, Montreal, QC, Canada.
- 4:00 PM – 4:15 PM 18 **Role of P53 in Regulation of Cell Death and Cell Survival in Teratogen Treated Day 9 Mouse Embryos.**
S.A. Little, P.E. Mirkes. University of Washington, Department of Pediatrics, Seattle, WA, United States.
- 4:15 PM – 4:30 PM 19 **Disruption of Heart Development by Trichloroethylene, a Common Groundwater Contaminant.**
V.J. Drake¹, S.L. Koprowski², J.W. Lough², S.M. Smith¹. ¹Department of Nutritional Sciences, University of Wisconsin-Madison, Madison, WI, United States, ²Department of Cell Biology, Anatomy and Neurobiology, Medical College of Wisconsin, Milwaukee, WI, United States.

Wednesday, June 30 (continued)

- 4:30 PM – 4:45 PM 20 **The Impact of Pax3 and Cystathionine Beta Synthase Mutations on Arsenic Induced Birth Defects.**
E.K. Marshall¹, A.F. Machado², A.F. Elsaid³, M.D. Collins¹. ¹University of California Los Angeles, Department of Environmental Health Sciences, Los Angeles, CA, United States, ²California State University, Northridge, Department of Environmental and Occupational Health, Northridge, CA, United States, ³University of California Los Angeles, Interdepartmental Program in Molecular Toxicology, Los Angeles, CA, United States.
- 4:45 PM – 5:00 PM 21 **Amelioration of Vitamin A-Induced Malformations in the Mid-Organogenesis-Stage Mouse Limb Bud by A Retinoic Acid Receptor Alpha and Gamma Selective Antagonist.**
S.E. Ali-Khan, B.F. Hales. McGill University, Department of Pharmacology and Therapeutics, Montreal, Quebec, Canada.
- 1:00 PM – 5:00 PM **PLATFORM SESSION II**—Regency Ballroom F
Clinical Teratology and Epidemiology
- 1:00 PM – 1:15 PM 22 **Hypospadias and Maternal Intake of Progestins and Oral Contraceptives.**
S.L. Carmichael¹, G.M. Shaw¹, C. Laurent¹, M. Croughan⁴, R.S. Olney², E.J. Lammer³. ¹MOD/CA Birth Defects Monitoring Program, Berkeley, CA, United States, ²CDC/NCBDDD, Atlanta, GA, United States, ³Children's Hospital Research Institute, Oakland, CA, United States, ⁴UCSF, San Francisco, CA, United States.
- 1:15 PM – 1:30 PM 23 **Ultrasound Imaging of the Neonatal Corpus Callosum Is Feasible and Useful.**
F.L. Bookstein, A.P. Streissguth, C. Gleason, T. Lalani, P.D. Connor, T. Keener, K. Baldwin, W.D.K. Green. University of Washington, Fetal Alcohol and Drug Unit, Seattle, WA, United States.
- 1:30 PM – 1:45 PM 24 **Autism and Ocular Malformations in CHARGE Association and Goldenhar Syndrome.**
K. Strömland¹, M. Miller², M. Johansson³, S. Danielsson³, E. Billstedt³, C. Gillberg³, B.M. Ekman-Joelsson⁴. ¹Pediatric Ophthalmology, Göteborg University, Göteborg, Sweden, ²Ophthalmology, University of Illinois, Chicago, United States, ³Child Neuropsychiatry, Göteborg University, Göteborg, Sweden, ⁴Pediatrics, Skövde, Sweden.

Wednesday, June 30 (continued)

- 1:45 PM – 2:00 PM 25 **Different Fetal Effects of Three Anticonvulsant Drugs on Skull and Face.**
D. Doan², L.A. Will², L.B. Holmes¹. ¹Genetics & Teratology Unit, Pediatric Service, Massachusetts General Hospital, Boston, MA, United States, ²Department of Growth and Development, Harvard School of Dental Medicine, Boston, MA, United States.
- 2:00 PM – 2:15 PM 26 **Change in Paternity As a Risk Factor for Gastroschisis.**
C.D. Chambers¹, B.H. Chen¹, K.A. Kalla², K.L. Jones¹. ¹University of California, San Diego, La Jolla, CA, United States, ²Kaiser Permanente Medical Center, San Diego, CA, United States.
- 2:15 PM – 2:30 PM 27 **Assisted Reproductive Techniques and the Risk of Oral Clefts: Data from the National Birth Defects Prevention Study, 1997–2000.**
J. Reefhuis¹, M. Honein¹, S. Rasmussen¹, A. Correa¹, C. Hobbs², A. Scheuerle³, L. Schieve⁴. ¹National Center on Birth Defects and Developmental Disabilities, CDC, Atlanta, GA, United States, ²University of Arkansas for Medical Sciences, Little Rock, AR, United States, ³Texas Department of Health, Austin, TX, United States, ⁴National Center for Chronic Disease Prevention and Health Promotion, CDC, Atlanta, GA, United States.
- 2:30 PM – 2:45 PM 28 **Maternal Obesity and Cardiovascular Malformations.**
A. Correa-Villaseñor, C.J. Alverson. CDC, NCBDDD, Atlanta, GA, United States.
- 2:45 PM – 3:00 PM 29 **Maternal Diabetes and Cardiovascular Malformations.**
M.K. Thong², A. Correa-Villaseñor¹, C.J. Alverson¹. ¹CDC, NCBDDD, Atlanta, GA, United States, ²University of Malay, Department of Pediatrics, Kuala Lumpur, Malaysia.
- 3:00 PM – 3:15 PM Break**
- 3:15 PM – 3:30 PM 30 **Diabetes, Body Mass Index, Vitamin Supplementation, and Anotia/Microtia.**
M.M. Werler, J.E. Sheehan, A.A. Mitchell. Slone Epidemiology Center at Boston University, Boston, MA, United States.
- 3:30 PM – 3:45 PM 31 **Impact of Maternal Alcohol Consumption on Sonographically–Visualized Fetal Brain Anatomy.**
N.S. Handmaker², W.F. Rayburn¹, C. Meng², B.B. Rayburn¹, A. Wodajo², V. Rappaport¹. ¹University of New Mexico, Obstetrics & Gynecology, Albuquerque, NM, United States, ²University of New Mexico, Psychology, Albuquerque, NM, United States.

Wednesday, June 30 (continued)

- 3:45 PM – 4:00 PM 32 **Placental Abnormalities Associated with Misoprostol Administration.**
K.K. Vaux¹, C.H. Chambers¹, R. Chamit², K. Benirschke³, E. Vanazzi⁴, K.L. Jones¹. ¹University of California, Department of Pediatrics, San Diego, CA, United States, ²University of California, San Diego, Department of Reproductive Medicine, San Diego, CA, United States, ³University of California, San Diego, Department of Pathology, San Diego, CA, United States, ⁴Universitat San Pablo, San Pablo, Brazil.
- 4:00 PM – 4:15 PM 33 **Alcohol Dehydrogenase 3 Genotype and Risk for Oro-facial Clefts: Role of the Maternal and Fetal Genotypes.**
C. Chevrier¹, C. Perret², A. Nelva³, C. Herman⁴, E. Robert-Gnansia⁵, M. Bahuau⁶, C. Francannet⁶, S. Cordier⁶. ¹INSERM U435, Rennes, France, ²INSERM U 525, Faculté de médecine Pitié-Salpêtrière, Paris, France, ³IEG, Lyon, France, ⁴CEMC Auvergne, Clermont-Ferrand, France, ⁵Service de Chirurgie Maxillo-faciale, Hôpital Trousseau, Paris, France, ⁶Service de Pédiatrie B, Hôpital-Dieu, Clermont-Ferrand, France.
- 4:15 PM – 4:30 PM 34 **Evaluation of the Teratogenicity of Homocysteine in Rat Embryos Cultured *In Vitro*.**
L.B. Fawcett, J.E. Pugarelli, R.L. Brent. Alfred I. duPont Hospital for Children, Department of Biomedical Science, Wilmington, DE, United States.
- 4:30 PM – 4:45 PM 35 **Neurdevelopmental Outcome of Infants and Toddlers Exposed Prenatally to Selective Serotonin Reuptake Inhibitors.**
S.N. Mattson¹, K.E. Calarco¹, K.K. Kao², K.L. Jones², C.D. Chambers². ¹Center for Behavioral Teratology, Department of Psychology, San Diego State University, San Diego, CA, United States, ²California Teratogen Information Service and Clinical Research Program, Department of Pediatrics, University of California, San Diego, San Diego, CA, United States.
- 4:45 PM – 5:00 PM 36 **Prenatal Exposure to Fluconazole: An Identifiable Dysmorphic Phenotype.**
E. Lopez-Rangel, M.I. Van Allen. University of British Columbia, Vancouver, Canada.

Wednesday, June 30 (continued)

1:00 PM – 5:00 PM

PLATFORM SESSION III—Regency Ballroom E

Genomics/Molecular Biology

- 1:00 PM – 1:15 PM 37 **Temporal and Spatial Distribution of Steroidogenic Acute Regulatory Protein in Developing Male Sprague-Dawley Rats Following Transplacental Exposure to 17- α -Ethinyl Estradiol or Bisphenol A.**
K.A. Hess, J.M. Naciff, G.J. Overmann, B.D. Richardson, L.M. Foertsch, G.P. Daston. Procter and Gamble Company, Miami Valley Laboratories, Central Product Safety, Cincinnati, OH, United States.
- 1:15 PM – 1:30 PM 38 **Transplacental Exposure to 17 α -Ethinyl Estradiol or Bisphenol A Induces a Specific Gene Expression Profile in the Developing Male Rat Reproductive System.**
J. Naciff, K. Hess, B. Richardson, G. Overmann, L. Foertsch, S. Torontali, G. Carr, J. Tiesman, G. Daston. The Procter & Gamble Company, Miami Valley Laboratories, Cincinnati, OH, United States.
- 1:30 PM – 1:45 PM 39 **Identification of Molecular Targets, Mechanisms and Biomarkers of Valproic Acid Teratogenicity Using a Toxicogenomics Approach.**
M. Stigson, K. Kultima, A.M. Nyström, M. Jergil, B. Scholz, A.L. Gustafson, L. Dencker. Uppsala University, Department of Pharmaceutical Biosciences, Uppsala, Sweden.
- 1:45 PM – 2:00 PM 40 **The Role of Antioxidant Enzymes and Transcription Factor NF- κ B in Diabetic Embryopathy in the Cohen Diabetic Rat Model.**
S.H. Ryu, S. Zangen, A. Ornoy. Hebrew University Hadassah Medical School, Jerusalem, Israel.
- 2:00 PM – 2:15 PM 41 **Heat Shock Protein 70 (Hsp70) Protects Embryos From Hyperthermia-Induced Exencephaly: Analysis Using Hsp70 Null Mice.**
M. Barrier¹, S. Gil¹, W.K. Kim², P.E. Mirkes¹. ¹University of Washington, Department of Pediatrics, Seattle, WA, United States, ²Hanyan University, Department of Anatomy and Cell Biology, Seoul, Korea, South.
- 2:15 PM – 2:30 PM 42 **Effects of Prenatal Exposure to Perfluorooctane Sulfonate on the Developing Lung in the Rat.**
R.C. Grasty², N. Roberts¹, C.S. Lau¹, B.E. Grey¹, J.M. Rogers¹. ¹Reproductive Toxicology Division, NHEERL, Office of Research and Development, U.S. EPA, Research Triangle Park, NC, United States, ²Curriculum in Toxicology, University of North Carolina, Chapel Hill, NC, United States.

Wednesday, June 30 (continued)

- 2:30 PM – 2:45 PM 43 **Developmental Toxicity of the Antimalarial Artesunate in Rats and Rabbits.**
T. White¹, S. Clode², I. Gaunt⁵, S. Ward³, C. Powell⁴, R. Clark¹. ¹GlaxoSmithKline, Safety Assessment Department, King of Prussia, PA, United States, ²Covance, Harrogate, North Yorkshire, United Kingdom, ³Liverpool School of Tropical Medicine, Liverpool, United Kingdom, ⁴GlaxoSmithKline, Safety Assessment Department, Ware, Hertfordshire, United Kingdom, ⁵Independent Consultant, London, United Kingdom.
- 2:45 PM – 3:00 PM 44 **Maternal Folate Deficiency Exacerbates the Developmental Toxicity of 5-Fluorouracil in Rats.**
B.D. Barbee, J.E. Andrews, B.E. Grey, H.P. Nicols, J.R. Thibodeaux, C.S. Lau, J.M. Rogers. U.S. EPA, Reproductive Toxicology Division, Research Triangle Park, NC, United States.
- 3:00 PM – 3:15 PM **Break**
- 3:15 PM – 3:30 PM 45 **Microarray Approaches to Identify Retinoid-Dependent Genes in Embryogenesis: Increased Collagen Fibril Production in a Model of Retinoid Insufficiency.**
G.R. Flentke¹, M.W. Baker¹, K.E. Docterman¹, S. Power¹, J. Lough², S.M. Smith¹. ¹Department of Nutritional Sciences, University of Wisconsin-Madison, Madison WI, United States, ²Department of Cell Biology, Anatomy & Neurobiology, Medical College of Wisconsin, Milwaukee, WI, United States.
- 3:30 PM – 3:45 PM 46 **Reduced Birth Defects Caused by Maternal Immune Stimulation in Methylnitrosourea.**
R. Prater¹, E.D. Strahl², K.L. Zimmerman², D.L. Ward², R.B. Gogal¹, S.D. Holladay². ¹Edward Via Virginia College of Osteopathic Medicine, Department of Biomedical Sciences, Blacksburg, VA, United States, ²VMRCVM, Virginia Tech, Department of Biomedical Sciences and Pathobiology, Blacksburg, VA, United States.
- 3:45 PM – 4:00 PM 47 **Integrating Human Genomics into Cluster Investigations of Birth Defects and Developmental Disabilities.**
C.A. Moore¹, M.L. Lindegren¹, M.A. Honein², S.A. Rasmussen², S. Panse¹, L. Nguyen¹, P.W. Yoon¹, M. Gwinn¹, M.J. Khoury¹. ¹CDC, Office of Genomics and Disease Prevention, Atlanta, GA, United States, ²CDC, National Center on Birth Defects and Developmental Disabilities, Atlanta, GA, United States.

Wednesday, June 30 (continued)

- 4:00 PM – 4:15 PM 48 **Influence of an Engineered p53 Mutant Protein (m53DD) on Mitochondrial Functional State Studied with a Novel Chip-Based Cell Fluorescence Assay.**
N.H. Owens, T.B. Knudsen. University of Louisville, School of Dentistry, Birth Defects Center, Louisville, KY, United States.
- 4:15 PM – 4:30 PM 49 **Discovering System-Level Features of the Early Mouse Embryo during Alcohol Intoxication.**
T.B. Knudsen, K.R. Nemeth, A.V. Singh. University of Louisville, School of Dentistry, Birth Defects Center, Louisville, KY, United States.
- 4:30 PM – 4:45 PM 50 **A Digenic Cause of Cleft Lip in A-strain Mice and Definition of Candidate Genes for the Two Loci.**
D.M. Juriloff, M.J. Harris, S.L. Dewell. Department of Medical Genetics, University of British Columbia, Vancouver, B.C., Canada.
- 4:45 PM – 5:00 PM 51 **Reproductive and Developmental Toxicity of LY900003 (AFFINITAK), an Antisense Oligonucleotide to the mRNA of Human PKC-alpha, in the Mouse and Rabbit.**
*K.G. Hilbish¹, A.E. Wakefield¹, K.I. Griffey¹, J.L. Hanes¹, A.M. Vick¹, V.R. Reddy¹, S.P. Henry², A.B. Astroff².
¹Lilly Research Laboratories, Eli Lilly & Company, Greenfield, IN, United States, ²ISIS Pharmaceuticals, Carlsbad, CA, United States.*
- 5:00 PM – 6:00 PM **BUSINESS MEETING**—Regency Ballroom E
- 7:00 PM – 8:00 PM **BANQUET RECEPTION**—Regency Ballroom A & B
- 8:00 PM **WILSON AND FRASER BANQUET**—Regency Ballroom C & D
F. Clarke Fraser Award Recipient: Karen Augustine, Bristol-Myers Squibb

THURSDAY, July 1

7:30 AM – 8:00 AM **REGISTRATION AND CONTINENTAL BREAKFAST**—Regency Foyer

8:00 AM – 11:00 AM **WILEY-LISS SYMPOSIUM**—Regency Ballroom E

The Role of Neural Crest Cells

Organized by Richard Miller, University of Rochester Medical Center; and Rocky Tuan, NIH/NIAMS

Sponsored by John Wiley and Sons

8:00 AM – 8:40 AM S32 **The Biology of Neural Crest Cells**
Speaker: Martin Garcia-Castro, California Institute of Technology

8:40 AM – 9:20 AM S33 **The Role of Neural Crest Cells and Craniofacial Development**
Speaker: Rob Krumlauf, Stowers Institute for Medical Research

9:20 AM – 9:40 AM Break

9:40 AM – 10:20 AM S34 **Cardiac Development and Cell Migration**
Speaker: Cecilia Lo, National Heart Lung Blood Institute

10:20 AM – 11:00 AM S35 **Neural Crest Cells in Cardiac Development**
Speaker: Margaret Kirby, Duke University

12:00 PM – 4:00 PM **COUNCIL II MEETING**—Prince of Wales Room



Annual Meeting Exhibitors

***The Teratology Society thanks
the following organizations for their
participation as Exhibitors at the
2004 Annual Meeting.***

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44th Annual Meeting

Exhibitor Information

(As of March 15, 2004)

All information printed in this exhibitor section is listed in alphabetical order and was submitted by the exhibiting company.

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