

# **The Teratology Society**

*40th*

*Annual Meeting*

**The Breakers Palm Beach, Florida**

*June 24–29, 2000*

**24th Annual Meeting of The Neurobehavioral Teratology Society (NBTS)**

**June 24–29, 2000**

*the*

**19th Annual Meeting of the Behavioral Toxicology Society (BTS)**

**June 24–29, 2000**

*and the*

**12th International Conference of the Organization of Teratology Information Services  
(OTIS)**

**June 24–27, 2000**

*Program*

*And*

*Abstracts*

*Program Agenda*

**11:00 am–5:00 pm Registration — South Loggia**

**12:00 pm–6:00 pm Council IA Meeting — Flagler Board Room**

**1:00 pm–5:15 pm Education Course — Mediterranean Ballroom**

## **Signal Transduction: Pathways to Growth, Differentiation, and Morphogenesis**

1:00 pm–1:05 pm Welcome

*Speaker: G.P. Daston, President, Teratology Society*

1:05 pm–1:15 pm Introduction

*Speaker: J. Jones, Bristol-Myers Squibb*

1:15 pm–2:00 pm Cell Adhesion Molecules and Signal Transduction

*Speaker: G. Grunwald, Thomas Jefferson University*

2:00 pm–2:45 pm Transforming Growth Factors- $\beta$ : Important Mediators of Mammalian Development

*Speaker: K. Flanders, National Cancer Institute*

2:45 pm–3:30 pm G Proteins: Master Switches in Cellular Signal Transduction

*Speaker: C. Ward, University of Pennsylvania*

3:30 pm–3:45 pm Coffee Break

3:45 pm–4:30 pm Protein Kinase C

*Speaker: E.S. Hunter, USEPA*

4:30 pm–5:15 pm Retinoid Receptors

*Speaker: D. Kochhar, Thomas Jefferson University*

**7:30 am–5:00 pm Registration — Ponce De Leon IV Foyer**

**7:00 am–2:00 pm Council IB Meeting — Flagler Board Room**

**7:30 am–12:00 pm Education Course — Mediterranean Ballroom**

*(Continued from Saturday)*

7:30 am–8:15 am Continental Breakfast

8:15 am–9:00 am Signal Transduction Pathways Regulating Cell Death (Apoptosis) or Cell Survival

*Speaker: P.E. Mirkes, University of Washington*

9:00 am–9:45 am Vasculogenesis and Angiogenesis: A Critical Gene Pathway for Embryonic Development

*Speaker: B. Abbott, USEPA*

9:45 am–10:15 am Coffee Break

10:15 am–11:00 am Endothelin

*Speaker: D. Srivastava, University of Texas Southwestern Medical Center*

11:00 am–11:45 am Roles of The Peroxisome Proliferator-Activated Receptors (PPARs) in Development

*Speaker: J.M. Peters, Pennsylvania State University*

11:45 am–12:00 pm Discussion/Adjournment

**1:30 pm–5:00 pm March of Dimes Symposium — Ponce De Leon V**

**Genetic Susceptibility to Teratogenesis**

*Chairpersons: Michael Collins, UCLA, Los Angeles, California and Michael Katz, March of Dimes, White Plains, New York*

*(Supported in part by March of Dimes Birth Defects Foundation Grant No.4-FY96-8960)*

1:30 pm–1:40 pm INTRODUCTION

*M.D. Collins, UCLA, Los Angeles, California and  
M. Katz, March of Dimes, White Plains, New York*

1:40 pm–2:20 pm S1 GENE-ENVIRONMENT INTERACTIONS IN BIRTH DEFECTS

*Speaker: J.C. Murray, The University of Iowa, Department of Pediatrics, Iowa City, Iowa*

2:20 pm–2:50 pm S2 WHOLE GENOME SCAN TO IDENTIFY CHROMOSOMAL LOCI ASSOCIATED WITH A STRAIN DIFFERENCE IN SUSCEPTIBILITY TO CADMIUM-INDUCED FORELIMB DEFECTS

*Speaker: M.D. Collins, UCLA, Los Angeles, California*

2:50 pm–3:05 pm BREAK

3:05 pm–3:35 pm S3 INSIGHTS FROM GENOME SCANS VERSUS CANDIDATE GENE POLYMORPHISMS FOR UNDERSTANDING THE ETIOLOGY OF TERATOGEN-INDUCED ORAL CLEFTS IN MOUSE AND MAN

*Speaker: S.R. Diehl, Craniofacial Epidemiology and Genetics Branch, NIDCR, NIH, Bethesda, Maryland*

3:35 pm–4:05 pm S4 INTERPRETATION OF TERATOGENETICS

*Speaker: D.M. Juriloff, Department of Medical Genetics, University of British Columbia, Vancouver, B.C., Canada*

4:05 pm–5:00 pm S5 HOLOPROSENCEPHALY AS A MODEL TO UNDERSTAND BRAIN DEVELOPMENT

*Speaker: M. Muenke, Medical Genetics Branch, National Human Genome Research Institute, NIH, Bethesda, Maryland, and The Children's Hospital of Philadelphia, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania*

**6:00 pm–7:30 pm Exhibits Open — Ponce De Leon IV**

**6:00 pm–7:30 pm President's Reception — Ponce De Leon IV**

*Sponsored by: Elsevier Science, Inc.*

**7:00 am–7:45 am Continental Breakfast**

**7:30 am–5:00 pm Registration — Ponce De Leon IV Foyer**

**7:45 am–8:00 am President's Welcome and Introduction — Ponce De Leon V**

George P. Daston

**8:00 am–8:45 am Warkany Lecture — Ponce De Leon V**

**Alteration of Pattern Formation as a Mechanism of Teratogenesis**

William J. Scott, Jr., University of Cincinnati

**9:00 am–12:10 pm Wiley-Liss Symposium — Ponce De Leon V**

**Angiogenesis**

*Chairpersons: William Slikker, Jr., National Center for Toxicological Research (FDA), Jefferson, Arkansas and Karen Augustine, Genetic, Reproductive and Developmental Toxicology Group, SmithKline Beecham*

**Pharmaceuticals, King of Prussia, Pennsylvania**

**Sponsored by: John Wiley & Sons, Inc.**

9:00 am–9:10 am S6 OVERVIEW

*Speakers: K.A. Augustine<sup>1</sup> and W. Slikker<sup>2</sup>, <sup>1</sup>Genetic, Reproductive and Developmental Toxicology Group, SmithKline Beecham Pharmaceuticals, King of Prussia, Pennsylvania; <sup>2</sup>National Center for Toxicological Research (FDA), Jefferson, Arkansas*

9:10 am–9:50 am S7 ENDOTHELIAL CELL ORIGINS AND BLOOD VESSEL MORPHOGENESIS

*Speaker: T.J. Poole, Department of Cell and Developmental Biology, Upstate Medical University, Syracuse, New York*

9:50 am–10:30 am S8 REGULATION OF VASCULOGENESIS AND ANGIOGENESIS

*Speaker: B.D. Abbott, Reproductive Toxicology Division, USEPA, Research Triangle Park, North Carolina*

10:30 am–10:45 am BREAK

10:45 am–11:25 am S9 MOLECULAR DETERMINANTS OF VASCULOGENIC MIMICRY BY AGGRESSIVE TUMOR CELLS: NEW THERAPEUTIC TARGETS FOR CLINICAL INTERVENTION

*Speaker: M.J.C. Hendrix, The University of Iowa Cancer Center, Iowa City, Iowa*

11:25 am–12:10 pm S10 ANTI-ANGIOGENIC THERAPIES INCLUDING THALIDOMIDE

*Speaker: D.I. Stirling, Celgene Corporation, Warren, New Jersey*

**12:00 pm–1:00 pm Past Presidents' Luncheon — Gulfstream F**

***Sponsored by Proctor & Gamble Company***

*(By Invitation Only)*

**1:00 pm–1:45 pm James G. Wilson Publication Award — Ponce De Leon V**

**1:45 pm–4:30 pm Platform I Session — Ponce De Leon V**

**1:45 pm–3:15 pm Platform Ia: Student Plenary Session 1**

***Chairpersons: Kit Keller, Consultant, Washington, District of Columbia and Craig Harris, University of Michigan, Ann Arbor, Michigan***

1:45 pm–2:00 pm 1 EFFECTS OF SERA FROM WOMEN WITH SYSTEMIC LUPUS ERYTHEMATOSUS (SLE) AND RECURRENT ABORTIONS ON HUMAN PLACENTAL EXPLANTS IN CULTURE

*S. Yacobi<sup>1</sup>, A. Ornoy<sup>1</sup>, and R.K. Miller<sup>2</sup>, <sup>1</sup>Hebrew University Hadassah Medical School, Jerusalem, Israel; <sup>2</sup>University of Rochester, Rochester, New York*

2:00 pm–2:15 pm 2 HIV-1 INFECTION IN EARLY HUMAN PLACENTAE *IN VITRO*: EFFECTS OF TUMOR NECROSIS FACTOR (TNF $\alpha$ ) AND INTERLEUKINS (IL-1 & IL-6)

*Y. Ding, T. Laughlin, B.M. Polliotti, and R.K. Miller, University of Rochester, Rochester, New York*

2:15 pm–2:30 pm 3 CASPASE-3 ENZYME ACTIVITY AS A MARKER FOR TERATOGEN-INDUCED APOPTOSIS IN DAY 9 MOUSE EMBRYOS AND ASSOCIATED YOLK SACS: EVIDENCE FOR YOLK SAC RESISTANCE TO TERATOGEN-INDUCED APOPTOSIS

*D. Soleman and P.E. Mirkes, Department of Pediatrics, University of Washington, Seattle, Washington*

2:30 pm–2:45 pm 4 LASER CAPTURE MICRODISSECTION TO EXPLORE A POTENTIAL RELATIONSHIP BETWEEN DIFFERENTIAL GENE EXPRESSION AND ETHANOL-INDUCED APOPTOSIS

*W.C. Dunty, Jr.<sup>1</sup>, P.S. Stockton<sup>2</sup>, R.C. Barber<sup>3</sup>, R.H. Finnell<sup>3</sup>, M. Miles<sup>4</sup>, S.-Y. Chen<sup>1</sup>, D.B. Dehart<sup>1</sup>, and K.K.*

*Sulik*<sup>1</sup>, *1*Dept. of Cell Biology and Anatomy, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina; *2*Laboratory of Experimental Pathology, NIEHS, Research Triangle Park, North Carolina; *3*Center for Human Molecular Genetics, University of Nebraska Medical Center, Omaha, Nebraska; and *4*Dept. of Neurology, Ernest Gallo Clinic and Research Center, University of California, San Francisco, California

2:45 pm–3:00 pm 5 EFFECT OF DEVELOPMENTAL EXPOSURE TO ETHANEDIMETHANE SULPHONATE (EDS), BROMOCHLOROACETIC ACID (BCA) AND MOLINATE ON WHOLE BODY TESTOSTERONE LEVELS IN CD-1 MICE

*D.K. Tarka*<sup>1,2</sup>, *G.R. Klinefelter*<sup>2</sup>, *J. Suarez*<sup>2</sup>, and *J.M. Rogers*<sup>1,2</sup>, *1*University of North Carolina, School of Medicine, Curriculum in Toxicology, Chapel Hill, North Carolina; *2*USEPA, NHEERL, Reproductive Toxicology Division, Research Triangle Park, North Carolina

3:00 pm–3:15 pm 6 DIABETIC EMBRYOPATHY: IMPACT OF THE SPLOTCH ALLELE

*A.F. Machado*<sup>1</sup>, *E.F. Zimmerman*<sup>2</sup>, *D.H. Hovland Jr.*<sup>1</sup>, *R. Weiss*<sup>1</sup>, and *M.D. Collins*<sup>1</sup>, *1*UCLA, Los Angeles, California; *2*Children's Hospital Research Found., Cincinnati, Ohio

### **3:15 pm–4:30 pm Platform Ib: Student Plenary Session 2**

**Chairpersons:** *Janet Uriu-Adams*, University of California, Davis, Davis California and *Jack Bishop*, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina

3:15 pm–3:30 pm 7 ENDOTHELIN-A RECEPTOR ANTAGONISM IN EMBRYO CULTURE: WINDOW OF SENSITIVITY AND TIMING OF DEFECT

*K.C. Brannen*, *J.M. Rogers*, and *E.S. Hunter*, Curriculum in Toxicology, University of North Carolina, Chapel Hill, North Carolina, and Reproductive Toxicology Division, NHEERL, USEPA, Research Triangle Park, North Carolina

3:30 pm–3:45 pm 8 DIFFERENTIAL EXPRESSION OF CELL CHECKPOINT REGULATOR/DNA DAMAGE SENSOR GENES DURING RAT EMBRYO ORGANOGENESIS *IN VIVO* AND *IN VITRO*

*R.K. Vinson* and *B. F. Hales*, McGill University, Montréal, QC, Canada

3:45 pm–4:00 pm 9 PK11195 INFLUENCES BIOGENESIS OF THE MOUSE mTDNA GENOME DURING NEURULATION

*R.J. Donahue*, *R.C. Craig*, *K.B. Knudsen*, and *T.B. Knudsen*, Department of Pathology, Anatomy and Cell Biology, Jefferson Medical College, Philadelphia, Pennsylvania

4:00 pm–4:15 pm 10 METHYLMERCURY TRANSIENTLY ALTERS MITOCHONDRIAL GENE EXPRESSION IN THE EMBRYO: EVIDENCE FOR DISRUPTION OF THE CELLULAR HEME PATHWAY

*M.F. O'Hara* and *T.B. Knudsen*, Department of Pathology, Anatomy and Cell Biology, Jefferson Medical College, Philadelphia, Pennsylvania

4:15 pm–4:30 pm 11 ANALYSIS OF MITOCHONDRIAL GENE EXPRESSION IN AN INTERVENTION MODEL FOR TERATOGENESIS

*J.H. Charlap*, *R.C. Craig*, and *T.B. Knudsen*, Department of Pathology, Anatomy and Cell Biology, Jefferson Medical College, Philadelphia, Pennsylvania

**4:00 pm–6:00 pm Poster Setup — Ponce De Leon IV**

**4:00 pm–10:00 pm Exhibits Open — Ponce De Leon IV**

**4:30 pm–6:00 pm Issues Forum — Ponce De Leon V**

**6:00 pm–7:30 pm Student Career Event — Ponce De Leon II**

*Jointly sponsored by Aventis, MARTA, MTA, and Pfizer, Inc.*

**7:30 pm–10:00 pm Poster Session — Ponce De Leon IV**  
(BTS 1–10; NBTS 1–10; Teratology Society 1–19)

*Sponsored by Covance Laboratories, Quintiles, SNBL USA, Springborn Laboratories, Inc. and TherImmune Research Corporation*

**7:30 am–8:15 am Continental Breakfast**

**7:30 am–8:30 am Exhibitors' Breakfast**

**7:30 am–5:00 pm Registration — Ponce De Leon IV Foyer**

**8:30 am–11:45 am NBTS/OTIS/Teratology Society Symposium — Ponce De Leon V**

**Folate Supplementation and Birth Defects**

*Chairpersons: Deborah Hansen, National Center for Toxicological Research, Jefferson, Arkansas and Elizabeth Yetley, Center for Food Safety and Applied Nutrition, Food and Drug Administration, Washington, District of Columbia*

**8:30 am–8:35 am INTRODUCTION**

*Speaker: D.K Hansen, National Center for Toxicological Research, Jefferson, Arkansas*

**8:35 am–9:10 am S11 POTENTIAL MECHANISM(S) FOR FOLATE PREVENTION OF NEURAL TUBE DEFECTS**

*Speaker: D.K Hansen, National Center for Toxicological Research, Jefferson, Arkansas*

**9:10 am–9:45 am S12 SUPPLEMENTATION WITH METHYL GROUP DONORS, FOLATE OR CHOLINE, DURING LATE PREGNANCY IN RATS IMPROVES VISUOSPATIAL MEMORY PERFORMANCE OF THE OFFSPRING**

*Speaker: C.L. Williams, Department of Psychology: Experimental, Duke University, Durham, North Carolina*

**9:45 am–10:00 am BREAK**

**10:00 am–10:35 am S13 NATIONAL FOLIC ACID FORTIFICATION: HOW WE GOT THERE AND NEXT STEPS**

*Speaker: E.A. Yetley, Center for Food Safety and Applied Nutrition, FDA, Washington, District of Columbia*

**10:35 am–11:10 am S14 PRE- AND POST-FORTIFICATION MONITORING OF FOLATE AND VITAMIN B12 STATUS**

*Speaker: P.F. Jacques, Jean Mayer-USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts*

**11:10 am–11:45 am S15 MONITORING CHANGES IN NEURAL TUBE DEFECT RATES — PRE- AND POST-FORTIFICATION**

*Speaker: J.D. Erickson, Centers for Disease Control and Prevention, Atlanta, Georgia*

**8:30 am–12:00 pm Developmental Risks of Disinfectant By-Products Symposium — Ponce De Leon I**

*Chairperson: E. Sidney Hunter, Reproductive Toxicology Division, NHEERL, USEPA, Research Triangle Park, North Carolina*

**8:30 am–8:45 am S16 SYMPOSIUM OVERVIEW**

*Speaker: E.S. Hunter, Reproductive Toxicology Division, NHEERL, USEPA, Research Triangle Park, North Carolina*

8:45 am–9:25 am S17 OCCURRENCE OF DISINFECTION BY-PRODUCTS IN DRINKING WATER: IMPLICATIONS FOR EPIDEMIOLOGY AND TOXICOLOGY STUDIES

*Speaker: S.W. Krasner, Metropolitan Water District of Southern California, La Verne, California*

9:25 am–10:00 am S18 REPRODUCTIVE AND DEVELOPMENTAL EFFECTS OF DISINFECTION BY-PRODUCTS IN DRINKING WATER

*Speaker: J.S. Reif, Department of Environmental Health, Colorado State University, Ft. Collins, Colorado*

10:00 am–10:15 am BREAK

10:15 am–10:45 am S19 TRIHALOMETHANE-INDUCED PREGNANCY LOSS IN RATS

*Speaker: M. Narotsky, Reproductive Toxicology Division, NHEERL, USEPA, Research Triangle Park, North Carolina*

10:45 am–11:25 am S20 BIOMARKERS OF TRICHLOROETHYLENE EXPOSURE

*Speaker: O. Selmin, Pediatric Cardiology, College of Medicine, University of Arizona Health Sciences Center, Tucson, Arizona*

11:25 am–12:00 pm S21 *IN VITRO* AND *IN VIVO* REPRODUCTIVE AND DEVELOPMENTAL TOXICITY OF DRINKING WATER DISINFECTION BY-PRODUCTS

*Speaker: R. Tyl, Center for Life Sciences and Toxicology, Research Triangle Institute, Research Triangle Park, North Carolina*

**1:00 pm–4:00 pm Platform II Session — Ponce De Leon V**

**1:00 pm–2:30 pm Platform IIa: Teratology Society/OTIS Joint Session 1**

*Chairpersons: Karen Filkins, UCLA School of Medicine, Los Angeles, California and Ashner Ornoy, Hebrew University Hadassah Medical School and Israeli Ministry of Health, Jerusalem, Israel*

1:00 pm–1:15 pm 12 DO ANTIEPILEPTIC DRUGS COMBINED WITH CAFFEINE INCREASE THE RISK OF BIRTH DEFECTS?

*E.B. Samrén<sup>1,2</sup>, C.M. van Duijn<sup>2</sup>, G.C.M.L. Christiaens<sup>4</sup>, A. Hofman<sup>2</sup>, and D. Lindhout<sup>1,3</sup>, <sup>1</sup>Department of Clinical Genetics, University Hospital Rotterdam, Rotterdam, The Netherlands; <sup>2</sup>Department of Epidemiology & Biostatistics, Erasmus University Medical School, Rotterdam, The Netherlands; <sup>3</sup>MGC-Department of Clinical Genetics, Erasmus University Rotterdam, Rotterdam, The Netherlands; <sup>4</sup>Department of Gynaecology and Obstetrics, University Medical Centre Utrecht, Utrecht, The Netherlands*

1:15 pm–1:30 pm 13 IS CARBAMAZEPINE ADMINISTRATION DURING PREGNANCY TERATOGENIC? A PROSPECTIVE CONTROLLED STUDY ON PREGNANCY OUTCOMES IN 229 EXPOSED WOMEN

*A. Ornoy<sup>1,2,3</sup>, S. Shechtman<sup>1,3</sup>, J. Arnon<sup>1,3</sup> and O. Diav-Citrin<sup>1,3</sup>, The <sup>1</sup>Israeli Teratogen Information Service; the <sup>2</sup>Hebrew University Hadassah Medical School; <sup>3</sup>Israel Ministry of Health, Jerusalem, Israel.*

1:30 pm–1:45 pm 14 PREGNANCY OUTCOME FOLLOWING GESTATIONAL EXPOSURE TO METRONIDAZOLE: A PROSPECTIVE CONTROLLED COHORT STUDY

*O. Diav-Citrin<sup>1,3</sup>, T. Gotteiner<sup>1,2</sup>, S. Shechtman<sup>1,3</sup>, J. Arnon<sup>1,3</sup>, and A. Ornoy<sup>1,2,3</sup>, The <sup>1</sup>Israeli Teratogen Information Service, the <sup>2</sup>Hebrew University Hadassah Medical School and <sup>3</sup>Israel Ministry of Health, Jerusalem, Israel*

1:45 pm–2:00 pm 15 FETAL ABNORMALITIES ASSOCIATED WITH HIGH-DOSE

## TRANYLCPROMINE IN TWO CONSECUTIVE PREGNANCIES

*D.S. Kennedy<sup>1</sup>, N. Evans<sup>1</sup>, I. Wang<sup>1</sup>, and W.S. Webster<sup>2</sup>, <sup>1</sup>Royal Prince Alfred Hospital and <sup>2</sup>The University of Sydney, Sydney, Australia*

## 2:00 pm–2:15 pm 16 MATERNAL ALCOHOL CONSUMPTION AND INTRAUTERINE GROWTH RETARDATION: A POPULATION-BASED CASE-CONTROL STUDY

*Q.H. Yang<sup>1</sup>, B.B. Witkiewicz<sup>2</sup>, R.S. Olney<sup>1</sup>, Y.C. Liu<sup>1</sup>, M. Davis<sup>1</sup>, M.J. Khoury<sup>1</sup>, A. Correal<sup>1</sup>, and J.D. Erickson<sup>1</sup>, <sup>1</sup>Centers for Disease Control and Prevention (CDC), Atlanta, Georgia; <sup>2</sup>Monroe County Department of Health, Rochester, New York*

## 2:15 pm–2:30 pm 17 PROSPECTIVE PREGNANCY OUTCOME IN WOMEN EXPOSED TO AMPHETAMINES

*R.J. Felix, C.D. Chambers, L.M. Dick, K.A. Johnson, and K.L. Jones, Department of Pediatrics, Division of Dysmorphology and Teratology, University of California San Diego, La Jolla, California*

## **2:30 pm–4:00 pm Platform IIb: Teratology Society/OTIS Joint Session 2**

***Chairpersons: Kathie Johnson, California Teratogen Information Service, Department of Pediatrics, UCSD, San Diego, California and Jan Freidman, University of British Columbia, Vancouver, Canada***

## 2:30 pm–2:45 pm 18 DESIGN OF A DATABASE OF HUMAN PRENATAL DRUG EXPOSURES ASSOCIATED WITH ADVERSE DEVELOPMENTAL OUTCOMES REPORTED TO FDA

*A. Vega<sup>1</sup> and S. Tabacova<sup>2</sup>, <sup>1</sup>CDER/FDA and <sup>2</sup>NCTR/ FDA, Rockville, Maryland*

## 2:45 pm–3:00 pm 19 ACCUTANE® - EXPOSED PREGNANCIES

*M.A. Honein and L. J. Paulozzi, Centers for Disease Control and Prevention, Atlanta, Georgia*

## 3:00 pm –3:15 pm 20 CONFIDENTIALITY AND DISCLOSURE ISSUES IN COUNSELING PREGNANT PATIENTS WHO REVEAL SUBSTANCE ABUSE: A CASE REPORT

*K. Filkins<sup>1</sup>, S. Beverly<sup>1</sup>, E. Chen<sup>1</sup>, D Johnstone<sup>2</sup>, J. Gordon<sup>2</sup>, and N. Catalano<sup>3</sup>, <sup>1</sup>UCLA School of Medicine, Department of Obstetrics and Gynecology, Los Angeles, California; <sup>2</sup>UCLA School of Medicine, Department of Clinical Social Work, Los Angeles, California; <sup>3</sup>California Teratogen Information Service, University of California, San Diego Medical Center*

## 3:15 pm–3:30 pm 21 DOES DRUG LABELING INFLUENCE RISK PERCEPTIONS OF TERATOGENICITY? A SURVEY OF PREGNANT WOMEN AND THEIR HEALTH PROFESSIONALS

*A. Einarson<sup>1</sup>, M.Pole<sup>1</sup>, T.R. Einarson<sup>2</sup>, N. Pairadeau<sup>3</sup>, and G. Koren<sup>1</sup>, <sup>1</sup>The Motherisk Program, The Hospital for Sick Children, <sup>2</sup>Faculty of Pharmacy, University of Toronto, and <sup>3</sup>Obstetrics Dept, North York General Hospital, Toronto, Canada*

## 3:30 pm–4:00 pm 22 SELF-SELECTION BIAS IN TERATOLOGY INFORMATION SERVICE PREGNANCY OUTCOME STUDIES

*K.A. Johnson<sup>1</sup>, P.A. Weber<sup>2</sup>, C.D. Chambers<sup>1</sup>, and K.L. Jones<sup>1</sup>, <sup>1</sup>Department of Pediatrics, Division of Dysmorphology and Teratology, University of California San Diego, La Jolla, California and <sup>2</sup>Kaiser Permanente of Southern California, San Diego, California*

## **1:00 pm–4:00 pm Platform III Session — Ponce De Leon I**

### **1:00 pm–2:30 pm Platform IIIa: Hazard/Risk Assessment Session 1**

***Chairpersons: James Schardein, WIL Research Laboratories, Ashland, Ohio and Patricia Bittner, Consumer Product Safety Commission, Washington, District of Columbia***

## 1:00 pm–1:15 pm 23 DEVELOPMENTAL TOXICITY INTERACTIONS OF METHANOL AND

RADIOFREQUENCY (RF) RADIATION OR 2-METHOXYETHANOL (2ME) IN RATS

*B.K. Nelson, D.L. Snyder, and P.B. Shaw, Division of Biomedical and Behavioral Science, NIOSH, Cincinnati, Ohio*

1:15 pm–1:30 pm 24 ADDITIVITY OF CARBON MONOXIDE AND PROTEIN DEFICIENCY ON NEONATAL MORTALITY IN MICE

*J. Singh, Stillman College, Tuscaloosa, Alabama*

1:30 pm –1:45 pm 25 THE PREDOMINANT ROLE OF MATERNAL TOXICITY IN LOVASTATIN-INDUCED DEVELOPMENTAL TOXICITY

*L.D. Wise, M.A. Cukierski, G.R. Lankas, and G.L. Skiles, Merck Research Laboratories, West Point, Pennsylvania*

1:45 pm–2:00 pm 26 PREGNANCY ALTERS THE PHARMACOKINETICS OF CYSTEAMINE IN THE PREGNANT RAT AND EFFECTS POSTNATAL DEVELOPMENT

*L.B. Fawcett, D.A. Beckman, L.K. Sherrell, J.E. Pugarelli, and F.K. Assadi, Department of Medical Cell Biology, Alfred I. duPont Hospital for Children, Wilmington, Delaware*

2:00 pm–2:15 pm 27 LEFLUNOMIDE AS AN EXAMPLE OF A MODERN APPROACH TO PRODUCT LABELING FOR REPRODUCTIVE EFFECTS:

A CATEGORY X DRUG BASED ON PHARMACOKINETIC DATA

*R.L. Brent, duPont Hospital for Children, Wilmington, Delaware*

2:15 pm–2:30 pm 28 THE EFFECTS OF *IN UTERO* EXPOSURE TO A LOW DOSE OF BISPHENOL A ON FEMALE SEXUAL MATURATION OF THE RAT

*C.E. Talsness and I. Chahoud, Institute of Clinical Pharmacology and Toxicology, Benjamin Franklin Medical Center, Freie Universitaet, Berlin, Germany*

**2:30 pm–4:00 pm Platform IIIb: Hazard/Risk Assessment Session 2**

***Chairpersons: Ed Carney, Dow Chemical Company, Midland, Michigan and Steve Harris, The Steve Harris Group, San Diego, California***

2:30 pm–2:45 pm 29 A THREE-DIMENSIONAL CULTURE SYSTEM SUPPORTS DEVELOPMENT OF INCISORS AND MOLARS IN MAXILLA AND MANDIBLE OF CULTURED MURINE FIRST ARCHES

*P. Williams, D. Montufar-Solis, and J. Duke, Dept. of Orthodontics, Dental Branch, UT Houston Health Science Center, Houston, Texas*

2:45 pm–3:00 pm 30 THE MECHANISM OF CLEFT PALATE FORMATION IN THE CHONDRODYSPLASIA MOUSE

*W. McLean<sup>1,4</sup>, I.G. Lavrin<sup>2</sup>, R.E. Seegmiller<sup>3</sup>, C.W. Archer<sup>4</sup>, E.D. Hay<sup>1</sup>, and B.R. Olsen<sup>1</sup>, <sup>1</sup>Harvard Medical School and <sup>2</sup>Harvard School of Dental Medicine, Boston, Massachusetts; <sup>3</sup>Brigham Young University, Provo, Utah; <sup>4</sup>Cardiff University, Cardiff, UK*

3:00 pm–3:15 pm 31 DEVELOPMENTAL TOXICITY STUDIES WITH GLYPHOSATE AND SELECTED SURFACTANTS IN RATS

*D.R. Farmer, T.A. Kaempfe, W.F. Heydens, and W.R. Kelce, Monsanto Company, St. Louis, Missouri*

3:15 pm–3:30 pm 32 RIO GRANDE RIVER WATER AND SEDIMENT EXTRACTS INDUCE NEURAL TUBE DEFECTS (NTD) IN XENOPUS

*D.J. Fort<sup>1</sup>, E.L. Stover<sup>1</sup>, J.A. Bantle<sup>2</sup>, and J.G. Burkhart<sup>3</sup>, <sup>1</sup>The Stover Group, Stillwater, Oklahoma; <sup>2</sup>Oklahoma State University Department of Zoology, Stillwater, Oklahoma; <sup>3</sup>NIEHS, Research Triangle Park, North Carolina*

3:30 pm–3:45 pm 33 MECHANISMS FOR DEVELOPMENTAL TOXICITY OF TOMUDEX  
*C. Lau, R.G. Hanson, D. Lui, M. L. Mole, M.G. Narotsky, J.M. Rogers and R.M. Zucker, Reproductive Toxicology Division, NHEERL, USEPA, Research Triangle Park, North Carolina*

3:45 pm–4:00 pm 34 MESOTRIONE: IS MOUSE THE RELEVANT MODEL FOR HUMANS OF THE DEVELOPMENTAL AND REPRODUCTIVE EFFECTS OF TYROSINE?  
*W.M. Provan and R.W. Lewis, Zeneca Central Toxicology Laboratory, Macclesfield, Cheshire, UK*

**4:00 pm–6:00 pm Poster Setup — Ponce De Leon IV**

**4:00 pm–6:00 pm Exhibits Open — Ponce De Leon IV**

**4:30 pm–6:00 pm Business Meeting — Ponce De Leon V**

**7:30 pm–10:00 pm Poster Session — Ponce De Leon IV**  
(NBTS 11–20; Teratology; Society 20–48)

*Sponsored by Covance Laboratories, Quintiles, SNBL USA, Springborn Laboratories, Inc. and TherImmune Research Corporation*

**7:30 am–8:15 am Continental Breakfast**

**7:30 am–5:00 pm Registration — Ponce De Leon IV Foyer**

**8:30 am–12:00 pm Public Affairs Symposium — Ponce De Leon V**

**What Do We Know About the Reproductive & Developmental Risks of Herbal and Alternate Remedies?**

*Chairpersons: Kenneth Jones, Department of Pediatrics, Division of Dysmorphology and Teratology, University of California, San Diego, La Jolla, California and Harpal Buttar, Bureau of Pharmaceutical Assessment, Health Protection Branch, Ottawa, Canada*

8:30 am–8:45 am INTRODUCTION  
*H.S. Buttar, Bureau of Pharmaceutical Assessment, Health Protection Branch, Ottawa, Canada*

8:45 am–9:15 am S22 POTENTIAL TOXICITIES OF HERBAL THERAPIES IN THE DEVELOPING FETUS  
*Speaker: T.M. Jurgens, College of Pharmacy, Dalhousie University, Halifax, Nova Scotia, Canada*

9:15 am–9:45 am S23 HERBAL REMEDIES IN PREGNANCY - METHODOLOGICAL AND PRACTICAL ISSUE  
*Speaker: G. Koren, The Motherisk Program, Toronto, Ontario, Canada*

9:45 am–10:15 am S24 INTERACTIONS OF HERBAL AND ALTERNATE REMEDIES WITH CONVENTIONAL MEDICINES  
*Speaker: B.A. Buehler, University of Nebraska Medical Center, Omaha, Nebraska*

**10:15 am - 10:45 am WARKANY TEA**

10:45 am–11:15 am S25 PREGNANCY OUTCOME IN WOMEN USING HERBAL AND ALTERNATE THERAPIES  
*Speaker: T. Johns, School of Dietetics and Human Nutrition, McGill University, Ste. Anne de Bellevue, Quebec, Canada*

11:15 am–11:45 am S26 REGULATORY ISSUES CONCERNING THE SAFETY AND EFFICACY OF

## HERBAL AND ALTERNATIVE REMEDIES

*Speaker: C.G. Rousseaux, Department of Cellular and Molecular Medicine, Faculty of Medicine, University of Ottawa, Ontario, Canada*

11:45 am–12:00 pm DISCUSSION

*K. Jones, Department of Pediatrics, Division of Dysmorphology and Teratology, University of California, San Diego, La Jolla, California*

**1:00 pm–4:45 pm Workshop I — Ponce De Leon V**

### **Interpretation of Data on Developmental Neurotoxicity**

***Chairpersons: Carole Kimmel, USEPA, NCEA, Washington, District of Columbia and Deborah Rice, National Center for Environmental Assessment, USEPA, Washington, District of Columbia***

1:00 pm–1:10 pm WORKSHOP OVERVIEW

*C.A. Kimmel, USEPA, NCEA, Washington, District of Columbia*

1:10 pm–2:00 pm W1 NEUROBEHAVIORAL DATA INTERPRETATION IN NEUROTOXICITY STUDIES: FOB, MOTOR ACTIVITY AND FUNCTION

*Speaker: V.C. Moser, USEPA, Research Triangle Park, North Carolina*

2:00 pm–2:50 pm W2 SENSORY SYSTEM TESTING

*Speaker: L.D. Fechter, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma*

2:50 pm–3:40 pm W3 INTERPRETATION OF TESTS OF COGNITIVE FUNCTION IN ANIMAL MODELS OF DEVELOPMENTAL NEUROTOXICOLOGY

*Speaker: D.C. Rice, NCEA, USEPA, Washington, District of Columbia*

3:40 pm–4:30 pm W4 ASSESSMENT OF DEVELOPMENTAL NEUROTOXICITY IN HUMANS

*Speaker: D.C. Bellinger, Children's Hospital, Boston, Massachusetts*

4:30 pm–4:45 pm GENERAL DISCUSSION

**1:00 pm–4:00 pm Workshop II — Ponce De Leon I**

### **Developmental Toxicokinetics: Lessons for Product Development**

***Chairpersons: Rakesh Dixit and L. David Wise, Merck Research Laboratories, West Point, Pennsylvania***

1:00 pm–1:10 pm INTRODUCTION

*R. Dixit and L.D. Wise, Merck Research Laboratories, West Point, Pennsylvania*

1:10 pm–1:50 pm W5 ANATOMICAL AND DEVELOPMENTAL ASPECTS OF MATERNAL-EMBRYONIC-FETAL INTERFACE

*Speaker: J. DeSesso, Biomedical Research Institute, Mitretek Systems, McLean, Virginia*

1:50 pm–2:10 pm W6 COMPARTMENTAL AND PHYSIOLOGICALLY-BASED TOXICOKINETICS IN RISK ASSESSMENT

*Speaker: D. Clarke, Lilly Research Laboratories, A Division of Eli Lilly & Company, Greenfield, Indiana*

2:10 pm–2:30 pm W7 APPLICATIONS AND LIMITATION OF DEVELOPMENTAL TOXICOKINETIC STUDIES: MECHANISTIC VS. RISK ASSESSMENT

*Speaker: R. Dixit, Department of Safety Assessment, Merck Research Laboratories (MRL), Merck and Company, Inc., West Point, Pennsylvania*

2:30 pm–4:00 pm W8 CLINICAL AND REGULATORY CONSIDERATIONS IN DEVELOPMENTAL TOXICOKINETICS

*Speaker: P.J. Wier, Safety Assessment, SmithKline Beecham Pharmaceuticals, King of Prussia, Pennsylvania*

**1:00 pm–4:00 pm Workshop III — Ponce De leon II**

**Teratology Society's Ethics Code, Certification, Disclaimer Guidelines and Expertise Recognition**

*Chairpersons: Robert L. Brent, du Pont Hospital for Children, Wilmington, Delaware Narsingh Agnish, Hoffman-LaRoche Inc., Nutley, New Jersey and Anthony R. Scialli, Georgetown University, Washington, District of Columbia*

1:00 pm–4:00 pm W9 OVERVIEW

*Speaker: R.L. Brent<sup>1</sup>, N. Agnish<sup>2</sup>, and A.R. Scialli<sup>3</sup>, 1du Pont Hospital for Children, Wilmington, Delaware, 2Hoffman-LaRoche Inc., Nutley, New Jersey, and 3Georgetown University, Washington, District of Columbia*

**4:00 pm–5:00 pm Historical Control Database Demonstration — Ponce De Leon II**

**4:00 pm–6:00 pm Council II Meeting — Flagler Board Room**

**6:30 pm–7:30 pm Banquet Reception — Circle Dining Room**

**6:30 pm–7:30 pm President's Circle Reception — Gold Room**  
*(By Invitation Only)*

**7:30 pm–10:30 pm Banquet — Venetian Ballroom**

**7:30 am–8:15 am Continental Breakfast**

**7:30 am–5:00 pm Registration — Ponce De Leon IV Foyer**

**8:30 am–11:45 am Platform IV Session — Ponce De Leon I**

**8:30 am–10:00 am Platform IVa: Clinical Teratology**

*Chairpersons: Jeanne Manson, University of Pennsylvania, Philadelphia, Pennsylvania and Lewis Holmes, Harvard University, Boston, Massachusetts*

8:30 am–8:45 am 35 IDENTIFYING CRITICAL WINDOWS OF EXPOSURE FOR CHILDREN'S HEALTH  
*S.G. Selevan<sup>1</sup>, C.A. Kimmell<sup>1</sup>, and P. Mendola<sup>2</sup>, USEPA, INCEA, Washington, DC, and 2NHEERL, Research Triangle Park, North Carolina*

8:45 am–9:00 am 36 CONGENITAL LATERAL RECTUS DEFICITS AND ASSOCIATED MALFORMATIONS AND SYNDROMES

*M.T. Miller<sup>1</sup> and K. Strömland<sup>2</sup>, 1University of Illinois at Chicago, Department of Ophthalmology, Chicago, Illinois; 2The Queen Silvia Children's Hospital, Department of Pediatric Ophthalmology, Göteborg, Sweden*

9:00 am–9:15 am 37 CHANGES IN CRANIOFACIAL FEATURES IN CHILDREN EXPOSED TO ANTIEPILEPTIC DRUGS IN UTERO

*H.I. Orup, Jr.<sup>1</sup>, B.A. Coull<sup>2</sup>, J. Adams<sup>3</sup>, L.M. Ryan<sup>2</sup> and L.B. Holmes<sup>1</sup>. 1Genetics and Teratology Unit, Pediatric Service, Massachusetts General Hospital; 2Department of Biostatistics, Harvard School of Public Health; and 3Department of Psychology, University of Massachusetts, Boston, Massachusetts*

9:15 am–9:30 am 38 THE CHILDREN OF THE SWEDES WITH THALIDOMIDE EMBRYOPATHY

*K. Strömland, M. Andersson Grönlund, and E. Philipsson, The Queen Silvia Children's Hospital, Department of*

*Pediatric Ophthalmology, Göteborg University, Göteborg, Sweden*

9:30 am–9:45 am 39 SURVIVAL OF INFANTS WITH SPINA BIFIDA AND ENCEPHALOCELE: A POPULATION STUDY, 1979-1994

*L-Y.C. Wong and L. Paulozzi, Centers for Disease Control and Prevention, Atlanta, Georgia*

9:45 am–10:00 am 40 NONGENITAL MALFORMATIONS AND EXPOSURE TO PROGESTATIONAL DRUGS DURING PREGNANCY: THE FINAL CHAPTER OF AN ERRONEOUS ALLEGATION

*R.L. Brent, duPont Hospital for Children, Wilmington, Delaware*

**10:00 am–11:45 am Platform IVb: Epidemiology**

**Chairperson: Joe Lary, Center for Disease Control and Prevention, Atlanta, Georgia**

10:00 am–10:15 am 41 GENOTYPES OF *HOXA1* AND *HOXB1* AND GENDER: SUSCEPTIBILITY TO AUTISM SPECTRUM DISORDERS

*P.M. Rodier<sup>1</sup>, C.J. Stodgell<sup>1</sup>, L.W. Weitkamp<sup>2</sup>, J.L. Ingram<sup>1</sup>, S.L. Hyman<sup>3</sup>, and D.A. Figlewicz<sup>4</sup>, Departments of <sup>1</sup>OB/GYN, <sup>2</sup>Psychiatry, <sup>3</sup>Pediatrics, and <sup>4</sup>Neurology, University of Rochester, Rochester, New York*

10:15 am–10:30 am 42 MATERNAL AND FETAL GENOTYPIC EFFECTS: TRANSFORMING GROWTH FACTOR ALPHA AND ORAL CLEFTS AS AN EXAMPLE OF A NEW PARADIGM

*D.F. Wyszynski<sup>1,2</sup>, T. Wu<sup>2</sup>, M.H. Khoshnevisan<sup>2</sup>, A. Miller-Chisholm<sup>2</sup>, M. Mazaheri<sup>3</sup>, R.E. Long Jr.<sup>3</sup>, and S.R. Diehl<sup>2</sup>, <sup>1</sup>Boston University School of Medicine, Boston, Massachusetts; <sup>2</sup>NIDCR, NIH, Bethesda, Maryland; <sup>3</sup>Lancaster Cleft Palate Clinic, Lancaster, Pennsylvania*

10:30 am–10:45 am 43 TRANSFORMING GROWTH FACTOR BETA 3 AND OROFACIAL CLEFTS

*P.A. Romitti, A.C. Lidral, J.C. Murray, S. Daack-Hirsch, and T.L. Burns, University of Iowa, Iowa City, Iowa*

10:45 am–11:00 am 44 GASTROSCHISIS PREVALENCE RATES: NO SECULAR TRENDS IN CALIFORNIA, FROM 1984 TO 1996

*C.P. Torfs and K. Deosaransingh, California Birth Defects Monitoring Program, Emeryville, California*

11:00 am–11:15 am 45 LOWERED WEIGHT GAIN DURING PREGNANCY AND RISK OF NEURAL TUBE DEFECTS AMONG OFFSPRING

*G.M. Shaw, K. Todoroff, S.L. Carmichael, D.M. Schaffer, and S. Selvin, California Birth Defects Monitoring Program, Emeryville, California*

11:15 am–11:30 am 46 PERICONCEPTIONAL INTAKE OF VITAMIN SUPPLEMENTS AND RISK OF MULTIPLE CONGENITAL ANOMALIES

*G.M. Shaw, L.A. Croen, K. Todoroff, and M.M. Tolarova, California Birth Defects Monitoring Program, Emeryville, California*

11:30 am–11:45 am 47 EVALUATION OF MARKERS FOR EARLY DETECTION OF PREGNANCY IN AN AUTOMATED DATABASE

*J. Manson<sup>1</sup>, B. McFarland<sup>2</sup>, S. Weiss<sup>3</sup>, C. Corelle<sup>2</sup>, <sup>1</sup>University of Pennsylvania, Philadelphia, Pennsylvania; <sup>2</sup>Kaiser Permanente Center for Health Research, Portland, Oregon; <sup>3</sup>University of Maryland, Baltimore, Maryland*

**9:00 am–11:30 am Platform V Session — Ponce De Leon V**

**9:00 am–10:15 am Platform Va: Modes of Action Session 1**

**Chairpersons: Dana Shuey, DuPont Pharmaceuticals Company, Newark, Delaware and Neil Chernoff, USEPA, Research Triangle Park, North Carolina**

9:00 am–9:15 am 48 EFFECTS OF VLA-4 ANTAGONISTS IN RAT WHOLE EMBRYO CULTURE  
*S. Spence*<sup>1</sup>, *C. Vetter*<sup>1</sup>, *W. Hagmann*<sup>2</sup>, *R. Mumford*<sup>3</sup>, *G. Van Riper*<sup>3</sup>, *H. Williams*<sup>3</sup>, and *J. Schmidt*<sup>3</sup>,  
*1Developmental & Reproductive Toxicology, 2Medicinal Chemistry, 3Pharmacology & Inflammation Research, Merck Research Labs, West Point, Pennsylvania*

9:15 am–9:30 am 49 ACTIVATION OF CASPASE-9 IN DAY 9 MOUSE EMBRYOS EXPOSED *IN VITRO* TO HYPERTHERMIA, 4-HYDROPEROXYCYCLO- PHOSPHAMIDE, AND STAUROSPORINE  
*S.A. Little and P.E. Mirkes, Department of Pediatrics, University of Washington, Seattle, Washington*

9:30 am–9:45 am 50 ANTIOXIDANT AMELIORATION OF ARSENICAL-INDUCED EFFECTS *IN VIVO*  
*E.S. Hunter and E.H. Rogers, Reproductive Toxicology Division, NHEERL, USEPA, Research Triangle Park, North Carolina*

9:45 am–10:00 am 51 EFFECTS OF TROGLITAZONE AND AMINOGLUTETHIMIDE ON RAT PLACENTAL AND FETAL WEIGHTS  
*P.J. Wier, E.A. Zahalka, S. Rehm, R. Kuk, A. Nix, and S. Murzyn, Safety Assessment, SmithKline Beecham Pharmaceuticals, King of Prussia, Pennsylvania*

10:00 am–10:15 am 52 HOMOCYSTEINE THIOLACTONE DOES NOT PRODUCE NEURAL TUBE DEFECTS IN MOUSE EMBRYOS *IN VITRO*  
*D.K. Hansen, T.F. Grafton, S. Melnyk and S.J. James, National Center for Toxicological Research, Jefferson, Arkansas*

#### **10:15 am–11:30 am Platform Vb: Modes of Action Session 2**

***Chairpersons: Stan Spence, Merck Research Laboratories, West Point, Pennsylvania and Cathy Price, Research Triangle Institute, Research Triangle Park, North Carolina***

10:15 am–10:30 AM 53 COMPARATIVE DEVELOPMENTAL TOXICITY OF THE GLYCOL ETHER METABOLITES, METHOXYACETIC ACID AND METHOXYPROPIONIC ACID  
*E.W. Carney and K.A. Johnson, The Dow Chemical Company, Midland, Michigan*

10:30 am– 10:45 AM 54 INHIBITION OF NEURAL CREST CELL MIGRATION BY THE WATER DISINFECTION BYPRODUCT BROMOCHLORO ACETIC ACID  
*J.E. Andrews*<sup>1</sup>, *H. Nichols*<sup>1</sup>, *J. Schmid*<sup>2</sup>, *G. Klinefelter*<sup>1</sup> and *E.S. Hunter*<sup>1</sup>, *1Reproductive Toxicology Division and 2Research Support Division, NHEERL, USEPA, Research Triangle Park, North Carolina*

10:45 am–11:00 AM 55 Cu DEFICIENCY ALTERS CARDIOVASCULAR STRUCTURE AND EXTRACELLULAR MATRIX (ECM) PROTEIN EXPRESSION DURING MURINE DEVELOPMENT  
*L. Lanoue, M.E. Beckers, T.E. Landerholm, R.B. Rucker, C.L. Keen and J.Y. Uriu-Adams, Nutrition Dept., University of California at Davis, Davis, California*

11:00 am–11:15 AM 56 THE TOXIC MECHANISM OF ALLANTOIC AGENESIS IN DCF TREATED EARLY POSTIMPLANTATION MOUSE EMBRYOS  
*M.J. Airhart, T.E. Kwasigroch, and R.G. Skalko, Department of Anatomy and Cell Biology, East Tennessee State University, Johnson City, Tennessee*

11:15 am–11:30 AM 57 MICROARRAY ANALYSIS OF ALTERED GENE EXPRESSION IN THE TESTES OF FETAL RATS EXPOSED TO DBP  
*V.D. Shultz, S.L. Phillips, P.M.D. Foster, and K.W. Gaido, CIIT, Research Triangle Park, North Carolina*

**12:00 pm–1:00 pm James G. Wilson and F. Clarke Fraser Awards Luncheon — Ponce De Leon IV**