Thursday, June 11, 2020

12:30 PM–2:00 PM COVID-19 and Pregnancy: What Do We Know and How Will We Learn More
Cohosted by the Organization of Teratology Information Specialists
Chairpersons: Christina D. Chambers, University of California–San Diego and Sonja A. Rasmussen, University of Florida

12:30 PM–12:35 PM Introduction
Elise M. Lewis, Charles River

12:35 PM–1:05 PM COVID-19 and Pregnancy: What Do We Know
Sonja A. Rasmussen, University of Florida

1:05 PM–1:35 PM COVID-19 and Pregnancy: How Will We Learn More
Christina D. Chambers, University of California–San Diego

1:35 PM–2:00 PM Discussion

Thursday, June 25, 2020

11:00 AM–11:05 AM President’s Welcome
BDRP President, Christine Perdan Curran, Northern Kentucky University

11:05 AM–11:45 AM Josef Warkany Lecture
POPs: A Plethora of Developmental Effects (L1)
Chairperson: Christine Perdan Curran, Northern Kentucky University
Lecturer: Linda S. Birnbaum, Scientist Emeritus and Former Director, National Institute of Environmental Health Sciences and National Toxicology Program

11:45 AM–12:30 PM Robert L. Brent Lecture—Teratogen Update (L2)
From Dysmorphology to Next-Generation Phenotyping
Chairperson: Christine Perdan Curran, Northern Kentucky University
Lecturer: Karen W. Gripp, A.I. duPont Hospital for Children/Nemours

12:30 PM–12:45 PM Break
12:45 PM–12:51 PM  
**Introduction**

12:51 PM–1:09 PM  
1. Gestational Exposure to Perfluorooctanoic Acid (PFOA) or Its Replacement GenX Induces Adverse Pregnancy Outcomes and Disrupts the Placenta  
Blake BE\(^1\), Cope H\(^1\), Hall S\(^2\), Keys R\(^1\), Mahler B\(^1\), McCord J\(^3\), Scott B\(^1\), Stapleton H\(^2\), Strynar M\(^3\), Elmore S\(^1\), Fenton S\(^1\).\(^1\)NTPL/NIEHS, Research Triangle Park, NC, United States, \(^2\)Duke University, Durham, NC, United States, \(^3\)US EPA, Research Triangle Park, NC, United States

1:09 PM–1:27 PM  
2. A Secondary Mechanism by Which Ethanol Enhances Macromolecular Damage and Behavioural Deficits in Brca\(^1\) Knockout Mice  
Drake DM\(^1\), Wells PG\(^1,2\).\(^1\)Department of Pharmaceutical Sciences and the Centre for Pharmaceutical Oncology (CPO), University of Toronto, Toronto, ON, Canada, \(^2\)Department of Pharmacology and Toxicology, University of Toronto, Toronto, ON, Canada

1:27 PM–1:45 PM  
3. Ozone Exposure during Early Pregnancy Alters Energy Balance and Adipose Morphology in Female Long-Evans Rat Offspring by Six Months of Age  
Nguyen HH\(^1\), Miller CN\(^1\), Stewart EJ\(^1\), Philips PM\(^2\), O’Shaughnessy KS\(^2\), Dye JA\(^2\).\(^1\)Oak Ridge Institute for Science and Education, Research Triangle Park, NC, United States, \(^2\)Public Health and Integrated Toxicology Division, Center for Public Health and Environmental Assessment, US EPA, Research Triangle Park, NC, United States

1:45 PM–2:03 PM  
4. Zika-Associated Birth Defects Among Infants with Possible Congenital Zika Virus Infection, Florida Zika Pregnancy and Infant Registry, January 2016–March 2018  
Elmore AL\(^1\), Dixon A\(^2\), Prieto J\(^3\), McDermott C\(^4\), Morrison A\(^4\), Lowry J\(^1\), Lake-Burger H\(^1\), Stanek D\(^4\).\(^1\)Florida Department of Health, Florida Birth Defects Registry, Tallahassee, FL, United States, \(^2\)University of South Florida, Birth Defects Surveillance Program, Tampa, FL, United States, \(^3\)Fulton County Board of Health, Atlanta, GA, United States, \(^4\)Florida Department of Health, Bureau of Epidemiology, Tallahassee, FL, United States
2:03 PM–2:21 PM  5  A Phenome-Wide Association Study of the Associations between Maternal Diabetes and Structural Birth Defects in Offspring in 6.5 Million Live Births
Schraw JM¹, Langlois PH², Lupo PJ¹. ¹Baylor College of Medicine, Houston, TX, United States, ²Texas Department of State Health Services, Austin, TX, United States

2:21 PM–2:39 PM  6  Reproductive Toxicity Studies to Evaluate Potential Neural Tube and Other Abnormalities Associated with Dolutegravir Exposure in Pregnancy
Mohan H¹, Guzman-Lenis M¹, Yukino Laurette E¹, Sanghvi T¹, Tejada O¹, Greene N², Copp A², Serghides L¹. ¹Toronto General Hospital Research Institute, University Health Network, Toronto, ON, Canada, ²Developmental Biology and Cancer Department, UCL Great Ormond Street Institute of Child Health, University College London, London, United Kingdom

2:39 PM–2:57 PM  7  Utilizing Toxicogeomics to Enhance Adverse Outcome Pathways and Testing Strategies
Chen H, Chidboy M, Robinson JF. Center for Reproductive Sciences and Department of Obstetrics, Gynecology & Reproductive Sciences, University of California, San Francisco, San Francisco, CA, United States

2:57 PM–3:15 PM  8  Differences in Cell Proliferation and Inflammation Pathways Regulate Prenatal Alcohol Sensitivity in Mice
Boschen KE¹, Mendoza-Romero HN¹, Fish EW¹, Peterson RL¹, Eberhart JK², Parnell SE¹,³. ¹Bowles Center for Alcohol Studies, University of North Carolina, Chapel Hill, NC, United States, ²Molecular Biosciences and Waggoner Center for Alcohol and Addiction Research, University of Texas, Austin, TX, United States, ³Department of Cell Biology and Physiology, University of North Carolina, Chapel Hill, NC, United States.

3:15 PM–4:30 PM  Presidents' Welcome Reception

Monday, June 29, 2020

11:00 AM–11:30 AM  F. Clarke Fraser New Investigator Award
Establishing a Research Program in Developmental Toxicology Utilizing In Vitro Models and Big Data Approaches
Chairperson: Suzanne E. Fenton, National Institute of Environmental Health Sciences
Lecturer: Joshua F. Robinson, University of California, San Francisco
11:30 PM–12:15 PM  James G. Wilson Publication Award
The effects of alcohol and cannabinoid exposure during the brain growth spurt on behavioral development in rats

Chairperson: Brian Enright, AbbVie Inc.
Lecturer: Kristen R. Breit, San Diego State University

12:15 PM–12:30 PM  Break

12:30 PM–2:30 PM  Investigation of a Potential Outbreak of Birth Defects Symposium

Chairpersons: Sonja A. Rasmussen, University of Florida and Cheryl S. Broussard, Centers for Disease Control and Prevention

12:30 PM–12:55 PM  S1  Ten Steps to a Field Investigation of an Increased Rate of Birth Defects  
Sonja A. Rasmussen, University of Florida

12:55 PM–1:20 PM  S2  Using Birth Defects Surveillance to Address a Possible Increased Rate of Birth Defects  
Peter H. Langlois, Texas Department of State Health Services

1:20 PM–1:45 PM  S3  Developing Interventions in Response to an Increase in Birth Defects  
Cheryl S. Broussard, Centers for Disease Control and Prevention

1:45 PM–2:10 PM  S4  Communicating with the Public during a Public Health Emergency Response  
Glen J. Nowak, University of Georgia

2:10 PM–2:30 PM  Discussion

12:30 PM–2:30 PM  Gene Therapy: CRISPR/Cas9 Technology, Breakthroughs, and Ethical Challenges Symposium

Organized by the Public Affairs Committee

Chairpersons: Gloria D. Jahnke, National Institute of Environmental Health Sciences and Evi Struble, US Food and Drug Administration

12:30 PM–1:00 PM  S5  Introduction to CRISPR-Cas9 Gene Editing  
Jennifer Mason, Clemson University

1:00 PM–1:30 PM  S6  The Use of CRISPR/Cas9 Technology to Study Congenital Malformations Caused by NAD Deficiency  
Paul R. Mark, Spectrum Health Medical Group

1:30 PM–2:00 PM  S7  Gene Therapy Products Using CRISPR/CAS9: Applications and Regulatory Considerations  
Shana D. Hardy, US Food and Drug Administration
2:00 PM–2:30 PM  S8  Ethical and Governance Considerations of Germline Gene Editing
Eric T. Juengst, University of North Carolina, Chapel Hill

2:30 PM–3:20 PM  Platform Session 2
Chairpersons: Linda G. Roberts, NapaTox Consulting LLC and Deirdre K. Tucker, Charles River Laboratories

2:30 PM–2:40 PM  9  Pathogenic Copy Number Variants Associated with Neurodevelopmental Impairment Detected in Chromosomal Microarray Analysis in Neonates with Congenital Heart Defects
Findley TO1, Crain AK2, Mahajan S2, Solis Zavala A2, Davis J3, Rodriguez-Burtica DF3. 1Division of Neonatal-Perinatal Medicine, Department of Pediatrics, McGovern Medical School, University of Texas Health Science Center at Houston, Houston, TX, United States, 2McGovern Medical School, University of Texas Health Science Center at Houston, Houston, TX, United States, 3Division of Medical Genetics, Department of Pediatrics, McGovern Medical School, University of Texas Health Science Center at Houston, Houston, TX, United States

2:40 PM–2:50 PM  10  Altered Mechanisms of Genital Development Identified Through Integration of DNA Methylation and Genomic Measures in Hypospadias
Richard MA1, Sok P1, Canon S2,3, Nembhard WN4, Brown AL1, Peckham-Gregory EC1, Ehli EA5, Kallsen NA5, Davies GE5, Patel A2,3, Zamilpa i2,3, Hobbs CA6, Scheurer ME1, Lupo PJ1. 1Department of Pediatrics, Baylor College of Medicine, Houston, TX, United States, 2Arkansas Children's Hospital, Little Rock, AR, United States, 3Department of Urology, University of Arkansas for Medical Sciences, Little Rock, AR, United States, 4Department of Epidemiology and Arkansas Center for Birth Defects Research and Prevention, Fay W. Boozman College of Public Health, University of Arkansas for Medical Sciences, Little Rock, AR, United States, 5Avera Institute for Human Genetics, Sioux Falls, SD, United States, 6Department of Pediatrics, College of Medicine, University of Arkansas for Medical Sciences, Little Rock, AR, United States

2:50 PM–3:00 PM  12  Increased Body Mass Index and Birth Defects Prevalence Across South Carolina, 2016–2018
Humphries B, Leedom VO. South Carolina Department of Health and Environmental Control, Columbia, SC, United States
3:00 PM–3:10 PM 13 Patterns of Congenital Malformations Co-
occuring with Nonsyndromic Gastroschisis and
Omphalocele
Oluwafemi OO1, Benjamin RH1, Navarro Sanchez
ML1, Scheuerle AE2, Schaaf CP3,4,5, Mitchell LE1,
Langlois PH6, Canfield MA6, Swartz MD7, Scott
DA8, Northrup HC, Ray JW9, McLean SD10, Ludorf
KL1, Chen H11, Lupo PJ12, Agopian A1.
1Department of Epidemiology, Human Genetics
and Environmental Sciences, UTHealth School of
Public Health, Houston, TX, United States,
2Department of Pediatrics, Division of Genetics
and Metabolism, University of Texas
Southwestern Medical Center, Dallas, TX, United
States, 3Jan and Dan Duncan Neurological
Research Institute, TX Children's Hospital,
Houston, TX, United States, 4Heidelberg
University, Institute of Human Genetics,
Heidelberg, Heidelberg, Germany, 5Department
of Molecular and Human Genetics, Baylor
College of Medicine, Houston, TX, United States,
6Birth Defects Epidemiology and Surveillance
Branch, TX Department of State Health Services,
Austin, TX, United States, 7Department of
Biostatistics and Data Science, UTHealth School
of Public Health, Houston, TX, United States,
8Department of Pediatrics, Division of Medical
Genetics, McGovern Medical School, University
of Texas Health Science Center at Houston,
Houston, TX, United States, 9Department of
Pediatrics, Division of Medical Genetics and
Metabolism, University of Texas Medical Branch,
Galveston, TX, United States, 10Clinical Genetics
Section, Children's Hospital of San Antonio, San
Antonio, TX, United States, 11Center for Precision
Health, UTHealth School of Public Health and
UTHealth School of Biomedical Informatics,
Houston, TX, United States, 12Department of
Pediatrics, Section of Hematology-Oncology,
Baylor College of Medicine, Houston, TX, United
States

3:10 PM–3:20 PM 14 Maternal Periconceptional Alcohol Consumption
and Gastroschisis in the National Birth Defects
Prevention Study, 1997–2011
Fisher S1, Howley MM1, Romitti PA2, Desrosiers
TA3, Anderson KN4, Jabs EW5, Browne ML6.
1New York State Congenital Malformations
Registry, New York State Department of Health,
Albany, NY, United States, 2Department of
Epidemiology, University of Iowa, Iowa City, IA,
United States, 3Department of Epidemiology,
Gillings School of Global Public Health, University
of North Carolina, Chapel Hill, NC, United States,
4National Center on Birth Defects and
Developmental Disabilities, Centers for Disease
3:30 PM–4:30 PM  
**Poster Session 1**  
Posters P1-P13 Attended for Questions & Answers

**Tuesday, June 30, 2020**

11:00 AM–11:45 AM  
**Keynote Lecture**  
Prenatal Genomic Medicine: Transforming Obstetric Practice and Delivering New Biological Insights (L3)  
Chairperson: Elise M. Lewis, Charles River  
Speaker: Diana W. Bianchi, Eunice Kennedy Shriver National Institute of Child Health and Human Development

11:45 AM–12:15 PM  
**Agnish Fellowship Lecture**  
Educating Future Birth Defects Researchers: Opportunities in the Era of Personalized Medicine, Systems Biology, and CRISPER Technologies  
Chairperson, Caren Villano, Bristol-Myers Squibb  
Speaker: Elaine M. Faustman, University of Washington

12:15 PM–12:30 PM  
**Break**

12:30 PM–2:30 PM  
**Opioid Use in Pregnancy: Translational Perspectives Symposium**  
Chairpersons: Christina D. Chambers, University of California–San Diego; Rina D. Eiden, Pennsylvania State University; and Jennifer Willford, Slippery Rock University

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<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>12:30 PM–1:00 PM</td>
<td>S9</td>
<td>Outcomes among Children of Opiate Using Mothers</td>
<td>Elisabeth Conradt, University of Utah</td>
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<td>1:00 PM–1:30 PM</td>
<td>S10</td>
<td>A Translational Model of Gestational Buprenorphine Exposure: Effects on the Dam and the Offspring</td>
<td>Susanne Brummelte, Wayne State University</td>
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<td>1:30 PM–2:00 PM</td>
<td>S11</td>
<td>Prenatal Exposure to Opioids and Other Substances: What Do We Know about Later Development Outcomes?</td>
<td>Hendrée Jones, UNC Department of Obstetrics &amp; Gynecology</td>
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<td>2:00 PM–2:30 PM</td>
<td>S12</td>
<td>Modifying an Evidence-Based Home Visiting Intervention for Mothers with Opioid Dependence</td>
<td>Mary Dozier, University of Delaware</td>
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12:30 PM–2:30 PM | Assessing and Modeling Perinatal和Postnatal Exposures to Environmental Chemicals in Support of Human Health Risk Assessment Symposium

Chairpersons: Laura Carlson, US Environmental Protection Agency and Geniece Lehmann, US Environmental Protection Agency

12:30 PM–12:50 PM | S13 Environmental Chemicals in Breast Milk and Formula: Exposure and Risk Assessment Implications
Judy S. LaKind, LaKind Associates

12:50 PM–1:10 PM | S14 Level of Detail for Pharmacokinetic Modeling During Development: Time or Tissues, But Not Both
Paul M. Schlosser, US Environmental Protection Agency

1:10 PM–1:30 PM | S15 Pharmacokinetic Modeling As a Tool to Bridge In Vitro, In Vivo, and Epidemiological Data in Risk Assessment of Developmental Exposures
Marc-Andre Verner, University of Montréal

1:30 PM–2:00 PM | S16 Children’s Nondietary Exposures to Environmental Chemicals
Paloma I. Beamer, University of Arizona

2:00 PM–2:20 PM | S17 A Review of Factors Influencing Children’s Exposure Assessment
Geniece Lehmann, US Environmental Protection Agency

2:20 PM–2:30 PM | Discussion

2:30 PM–3:20 PM | Platform Session 3

Chairpersons: Kimberly C. Brannen, Merck and Mark Herberth, Charles River

2:30 PM–2:40 PM | 15 Risk Factors and Time Trends for Diagnosis of Nonsyndromic Craniosynostosis
Schraw JM1, Woodhouse J1, Langlois PH2, Canfield MA2, Scheuerle AE3, Agopian A4, Benjamin RH4, Lupo PJ4. 1Department of Pediatrics, Baylor College of Medicine, Houston, TX, United States, 2Texas Department of State Health Services, Austin, TX, United States, 3University of Texas Southwestern Medical Center, Dallas, TX, United States, 4University of Texas School of Public Health, Houston, TX, United States

2:40 PM–2:50 PM | 16 Use of Cluster Analysis to Better Define a Distinct Clinical Phenotype Associated with Possible Congenital Zika Virus Infection
Zambrano LD1, Delaney A1, Gilboa SM1, Tong V1, Cragan JD1, Valencia M2, Roth NM1, Moore J1, Staples JE3, Honein MA1, Moore CA1. 1National
2:50 PM–3:00 PM  17  Prenatal Acetaminophen Use and Adverse Pregnancy Outcomes in Women with Autoimmune Conditions  
Killon J1, Chambers CD1,2, Bandoli G1,2.  
1Department of Family Medicine and Public Health, University of California San Diego, San Diego, CA, United States, 2Department of Pediatrics, University of California San Diego, La Jolla, CA, United States

3:00 PM–3:10 PM  18  The Role of In Utero Exposure to Drugs Beyond Opioids in the Development and Severity of Neonatal Opioid Withdrawal Syndrome (NOWS)  
Bailey BA1, Wood DL2, Shah DS2. 1Central Michigan University, Mt Pleasant, Michigan, United States, 2East Tennessee State University, Johnson City, TN, United States

3:10 PM–3:20 PM  19  Multi-Modal Assessment of Stress-Reactivity and Self-regulation in the Newborn Period in a Prospective Cohort Study of Moderate Alcohol Exposure  
Bakhireva LN1, Ruyak S1, Roberts M1, Rodriguez DE1, Leeman L1, Stephen J2, Maxwell JR1. 1University of New Mexico Health Sciences Center, Albuquerque, NM, United States, 2The Mind Research Network, Albuquerque, NM, United States

3:30 PM–4:30 PM  Poster Session 2  
Posters P14-P26 Attended for Questions & Answers

Wednesday, July 1, 2020

11:00 AM–12:00 Noon  Innovator Award Finalists Platform Session 4  
Chairperson: Suzanne E. Fenton, National Institute of Environmental Health Sciences

11:00 AM–11:20 AM  21  Studying Gene-Environmental Interactions in Autism with iPSC-derived BrainSpheres: microRNA and Metabolic Biomarkers of the Synergy  
Smirnova L, Zhong X, Modafferi S, Fagiani F, Kleensang A, Murata Y, Hartung T. Johns Hopkins University, Baltimore, MD, United States
11:20 AM–11:40 AM  22  ReproTracker: A Human Stem Cell-Based Biomarker Assay for In Vitro assessment of Developmental Toxicity  

11:40 AM–12:00 Noon  23  A Tale of Two Livers: The Impact of Sex on Hepatic Gene Expression in the Adolescent Rat Exposed to Ozone During Implantation  
Miller CN1, Stewart EJ2, Schladweiler MC3, Ren H3, Valdez MC1, Fisher A3, Kodavanti UP3, Dye JA3. 1Oak Ridge Institute for Science and Education, Research Triangle Park, NC, United States, 2Oak Ridge Institute for Science and Education, Research Triangle Park, NC, United States, 3Public Health and Integrated Toxicology Division, Center for Public Health and Environmental Assessment, US Environmental Protection Agency, Research Triangle Park, NC, United States

12:00 Noon–12:30 PM  Warkany Tea

12:30 PM–2:30 PM  Wiley Symposium  
Pregnancy, Environment, and Child Health: A Focus on Obesity and Metabolic Disorders  
Chairpersons: Suzanne E. Fenton, National Institute of Environmental Health Sciences and Jerrold J. Heindel, Commonweal

12:30 PM–12:54 PM  S18  Endocrinological and Environmental Control of Obesity  
Jerrold J. Heindel, Commonweal

12:54 PM–1:18 PM  S19  Environmental Influences on the Childhood Obesity Epidemic  
Leonardo Trasande, NYU School of Medicine

1:18 PM–1:42 PM  S20  Effects of Developmental Exposure to Genx on Mouse Offspring: Pubertal and Metabolic Targets  
Suzanne E. Fenton, National Institute of Environmental Health Sciences

1:42 PM–2:06 PM  S21  How Does Prenatal Obesogen Exposure Lead to a Transgenerational Predisposition to Obesity?  
Bruce Blumberg, University of California, Irvine

2:06 PM–2:30 PM  S22  The Role of Maternal Obesity and Pregnancy Weight Gain Patterns in Pregnancy and Birth, and Longer-Term Health Outcomes  
Elizabeth Widen, University of Texas at Austin
12:30 PM–2:30 PM  
**HESI Symposium**  
Assessing Pregnancy Risk of Immunomodulators

*Chairpersons: Caren Villano, Bristol-Myers Squibb and Dinesh J. Stanislaus, GlaxoSmithKline*

12:30 PM–12:55 PM  S23  
**Immune Mechanisms and Immunoregulation: Role in Fertility, Gestation, and Parturition**  
Joanne Kwak-Kim, Rosalind Franklin University of Medicine and Science

12:55 PM–1:20 PM  S24  
**Current Methods to Assess Pregnancy Risk for Immunomodulators**  
Caren Villano, Bristol-Myers Squibb

1:20 PM–1:45 PM  S25  
**Case Studies: Gestational Exposures to Immunomodulators in Nonclinical Species**  
Aimee Hillegas, GlaxoSmithKline

1:45 PM–2:10 PM  S26  
**Gaps in Evaluation of Immune Function during Pregnancy: Workshop Summary**  
Christopher J. Bowman, Pfizer Inc.

2:10 PM–2:30 PM  
**Panel Discussion**

2:30 PM–3:30 PM  
**Platform Session 5**

*Chairpersons: Philip Lupo, Baylor College of Medicine and Kristina York, Charles River Laboratories*

2:30 PM–2:40 PM  24  
**Adverse Outcome Pathways for Developmental Toxicity Gleaned from the Embryological Literature: A Rich and Rutted Road**  
Rogers JM. US Environmental Protection Agency, Research Triangle Park, NC, United States

2:40 PM–2:50 PM  25  
**Automated Applications of Ontologies to Standardize Developmental Toxicology Study Extraction**  
Foster C1, Wignall J1, Kovach S1, Trgovcich J1, Varghese A1, Rochester J1, Stout M2, Kleinstreuer NC2. 1ICF International Inc, Durham, NC, United States, 2NIEHS/NTP, Durham, NC, United States

2:50 PM–3:00 PM  26  
**Mouse Model of Dolutegravir-Induced Neural Tube Defects**  
Bredehoeft MR, Feser-Stessman HA, Hulen J, Hallgren J, Gelineau-van Waes J. Creighton University, Omaha, NE, United States

3:00 PM–3:10 PM  27  
**Alterations in the Mouse Placenta After Preconception and Prenatal Arsenic Exposure**  
Rychlik KA, Kashiwagi C, Liao J, Sillé FC. Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD, United States
3:10 PM–3:20 PM 28 Quantitative Proteomic Analyses of Perfluorooctanoic Acid with Primary Human Villous Trophoblasts

3:20 PM–3:30 PM 29 Quantification of the Uncertainties in Extrapolating from In Vitro Androgen Receptor (AR) Antagonism to In Vivo Hershberger Assay Endpoints and Adverse Reproductive Development in Male Rats
Gray EE. US EPA, ORD, CPHEA, PHITD, RDTB, Durham, NC, United States

3:30 PM–4:30 PM  Poster Session 3
Posters P27-P40 Attended for Questions & Answers

Thursday, July 2, 2020

11:00 AM–12:00 Noon  BDRP and European Teratology Society Exchange Lecture
Early Principles of Teratology: Does Karnofsky’s Law Still Apply
Chairpersons: Susan L. Makris, US Environmental Protection Agency and Nicola Suzanne Powles-Glover, AstraZeneca

Dr. David Karnofsky: The First 50 Years
European Teratology Society
Derek Newall, Derek R Newall, European Teratology Society Past-President

Dr. David Karnofsky: Can He Rest in Peace or Do We Have a Way to Go?
BDRP
Alan M. Hoberman, Charles River

12:00 Noon–12:15 PM  Break

12:15 PM–2:30 PM  Single-Cell Revolution: Embryogenesis at High-Resolution Symposium
Organized by the BDRP Science Committee
Chairpersons: Thomas B. Knudsen, National Center for Computational Toxicology, US EPA and Elaine M. Faustman, University of Washington

12:15 PM–12:45 PM  S27  Teratogenesis at the Single-Cell Level: Opportunities and Challenges
Thomas B. Knudsen, National Center for Computational Toxicology, US EPA

12:45 PM–1:15 PM  S28  Development and Disease at Single Cell Resolution Development and Disease at Single Cell Resolution
Malte Spielmann, Max Planck Institute for Molecular Genetics

1:15 PM–1:45 PM  S29  What scRNAseq Is Now Telling Us about Embryology
Sean Megason, Harvard Medical School
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<th>Time</th>
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<th>Presenters</th>
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<tr>
<td>1:45 PM–2:15 PM</td>
<td>S30</td>
<td>How Single-Cell Profiling Data Can Be Applied to Improve Children’s Health</td>
<td>Elaine M. Faustman, University of Washington</td>
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<td>2:15 PM–2:30 PM</td>
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<td>Panel Discussion</td>
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<td>2:30 PM–3:20 PM</td>
<td><strong>Platform Session 6</strong></td>
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<td>Chairpersons: Bruce K. Beyer, Sanofi U.S. Inc. and Alan M. Hoberman, Charles River</td>
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<td>2:30 PM–2:40 PM</td>
<td>30</td>
<td>Evaluation of Bisphenol Analogue Exposure on Mouse Adipose Gene Expression In Vivo and In Vitro Using 3T3-L1 Cells</td>
<td>Chappell VA, Tucker DK, Fenton S. NTPL/NIEHS, Research Triangle Park, NC, United States</td>
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<td>2:40 PM–2:50 PM</td>
<td>31</td>
<td>Maternal Diabetes and Risk for Birth Defects, by Race and Ethnicity, National Birth Defects Prevention Study, 1997–2011</td>
<td>Tinker SC, Gilboa SM, Moore CA, Waller DK, Simeone RM, Kim SY, Jamieson DJ, Botto LD, Fisher S, Reehuis J. Centers for Disease Control and Prevention, Atlanta, GA, United States, University of Texas Health Science Center at Houston, Houston, TX, United States, Emory University School of Medicine, Atlanta, GA, United States, University of Utah School of Medicine, Salt Lake City, UT, United States, New York State Department of Health, Albany, NY, United States</td>
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<td>2:50 PM–3:00 PM</td>
<td>32</td>
<td>Modeling Shows High Potential for Preventing Major Neural Tube Defects with Folic Acid Fortification of Iodized Salt</td>
<td>Kancherla V, Tsang B, Dixon MA, Wagh K, Oakley G Jr. Emory University Rollins School of Public Health, Atlanta, GA, United States, Food Fortification Initiative, Atlanta, GA, United States</td>
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Prevalence of Select Brain and Eye Defects Potentially Related to Zika Virus in Pregnancy

Delaney AM1, Olson SE2, Roth NM3, Cragan J3, Godfred-Cato S3, Fornoff J4, Nestoridi E5, Forkner A6, Stolz A7, Cho SJ8, Knapp M9, Crawford K10, Breidenbach R11, Nance A12, Elmore AL13, Denson L14, Forestieri N15, Leedom V16, Tran T17, Romitti PA18, Valencia M19, Barton J20, St. John K21, Kimura J22, Orantes L23, Ellis EM24, Tong VT18, Gilboa SM18, Moore CA25, Honein MA25. 1Eagle Global Scientific, LLC, Atlanta, GA, United States, 2G2S Corporation, San Antonio, TX, United States, 3National Center on Birth Defects and Developmental Disabilities, CDC, Atlanta, GA, United States, 4Illinois Department of Public Health, Springfield, IL, United States, 5Massachusetts Department of Public Health, Boston, MA, United States, 6Indiana State Health Department, Indianapolis, IN, United States, 7New York State Department of Health, Bureau of Environmental & Occupational Epidemiology, Albany, NY, United States, 8Minnesota Department of Health, St. Paul, MN, United States, 9New Jersey Department of Health, Trenton, NJ, United States, 10Virginia Department of Health, Richmond, VA, United States, 11Birth Defects Epidemiology and Surveillance Branch, TX Department of State Health Services, Austin, TX, United States, 12Utah Department of Health, Salt Lake City, UT, United States, 13Florida Department of Health, Tallahassee, FL, United States, 14Oklahoma State Department of Health, Oklahoma City, OK, United States, 15North Carolina Department of Health and Human Services, Raleigh, NC, United States, 16South Carolina Dept. of Health & Environmental Control, Columbia, SC, United States, 17Louisiana Department of Health, New Orleans, LA, United States, 18University of Iowa, Iowa, IA, United States, 19Puerto Rico Department of Health, San Juan, PR, United States, 20Georgia Department of Public Health, Atlanta, GA, United States, 21Rhode Island Department of Health, Providence, RI, United States, 22Hawaii Department of Health, Honolulu, HI, United States.
3:30 PM–4:30 PM  Closing Session: Awards Announcements and Annual Business Meeting

EDUCATION COURSES

Thursday, July 16, 2020

11:00 AM–12:30 PM  Course 1: Embryology and Toxicity of the Developing Immune System
(Separate Registration Required)
Organized by the Education Committee
Chairperson: Caren Villano, Bristol-Myers Squibb

11:00 AM–11:05 AM  Course Overview
Education Committee, Chairperson, Caren Villano, Bristol-Myers Squibb

11:05 AM–11:20 AM  Immunotoxicology Overview
Jeanine L. Bussiere, Amgen, Inc.

11:20 AM–11:45 AM  Comparative Development of the Immune System
John Krayer, Janssen

11:45 AM–12:15 PM  Developmental Immunotoxicology
Jamie C. DeWitt, East Carolina University

12:15 PM–12:30 PM  Questions and Answers

Thursday, July 23, 2020

11:00 AM–2:30 PM  Education Course 2: Juvenile Toxicology
(Separate Registration Required)
Organized by the Education Committee
Chairperson: Caren Villano, Bristol-Myers Squibb

11:00 AM–11:05 AM  Course Overview
Education Committee, Chairperson, Caren Villano, Bristol-Myers Squibb

11:05 AM–11:45 AM  Overview of Juvenile Toxicology
Jia Yao, US Food and Drug Administration

11:45 AM–12:25 PM  Approaches to Juvenile Animal Testing
Susan Bielmeier Laffan, GlaxoSmithKline

12:25 PM–12:40 PM  Questions and Answers

12:40 PM–12:55 PM  Break
12:55 PM–1:35 PM  Organ System Development in Juvenile Nonclinical Species  
*Wendy Halpern, Genentech*

1:35 PM–2:15 PM  Clinical Relevance for Pediatric Populations  
*Susan McCune, US Food and Drug Administration*

2:15 PM–2:30 PM  Questions and Answers

**Thursday, July 30, 2020**

**11:00 AM–12:30 PM Education Course 3: Assessment of Ovarian Toxicity**  
(Separate Registration Required)
*Organized by the Education Committee*
*Chairperson: Caren Villano, Bristol-Myers Squibb*

11:00 AM–11:05 AM  Course Overview  
*Education Committee, Chairperson, Caren Villano, Bristol-Myers Squibb*

11:05 AM–11:35 AM  Detecting Ovarian Follicles by Deep Learning and Not *In Vivo* Ovarian Models  
*Heike Antje Marxfeld, BASF*

11:35 AM–12:05 PM  *In Vitro* Ovarian Models  
*Shuo Xiao, University of South Carolina*

12:05 PM–12:30 PM  Questions and Answers