Unifying Mechanisms of Neurological Disorders: Scientific, Translational, and Clinical Implications

PROGRAM

Sunday Afternoon  6 June 2010  2:00 PM – 2:20 PM
Opening

SESSION I: OPENING, WELCOME AND ACKNOWLEDGEMENTS

Conference Co-Chairs:
Joan M. Cranmer, Kenneth R. Reuhl, Jason R. Richardson

2:00 – 2:20 PM
Opening and Welcome!

Acknowledgements

Introductions

Sunday Afternoon  6 June 2010  2:20 PM – 5:30 PM
Symposium

SESSION II: DIETARY EXPOSURE TO METHYL MERCURY FROM FISH CONSUMPTION: NEW FINDINGS FROM THE SEYCHELLES CHILD DEVELOPMENT STUDY

Session Chair:  Philip W. Davidson

Theme and Rationale: The Seychelles Child Development Study (SCDS) is a longitudinal evaluation of prenatal exposure to MeHg from fish consumption. The study began in the mid 1980s and has followed several cohorts of subjects whose mothers consumed a diet high in fish during pregnancy. The subjects themselves also habitually consume a diet high in fish. Initial results indicated that prenatal MeHg exposure was associated with “beneficial” outcomes on specific cognitive domains such as psychomotor performance and discrimination learning. Subsequent studies indicated that prenatal MeHg exposure effects may be modified by simultaneous exposure to long-chain polyunsaturated fatty acids (LCPUFA) which are also present in fish. The net effect of combined exposure to LCPUFA and MeHg on the developing fetal brain appears beneficial for specific neurocognitive and behavioral outcomes. Analyses that include postnatal MeHg exposure have revealed a different pattern of results with possible adverse effects on cognitive functions including impulsivity/response inhibition and social behaviors. These endpoints were not associated with prenatal exposure to MeHg. Additional studies that include exposure to Hg vapor from dental amalgams and selenium, which is present in high concentrations in fish, do not change these effects. Nutrients in fish appear to modify the adverse effects of co-exposure to MeHg in a manner that is related to the time of exposure. The differential risks and benefits of fish consumption with co-exposure to LCPUFA and both prenatal and postnatal MeHg appear to be much more complex than currently understood and the toxicant-nutrient interplay opens a new line of scientific inquiry of substantial public health relevance.

Topics and Speakers:

2:20 – 2:45 PM
Associations between Prenatal and Postnatal MeHg and Neurocognitive and Behavioral Endpoints at 17 Years of Age in the Seychelles Child Development Study
Deborah A. Cory-Slechta, University of Rochester School of Medicine

2:45 – 3:10 PM
Selenium Status and its Relation to Child Development in the Seychelles Child Development Nutrition Study
Gary J. Myers, University of Rochester School of Medicine

3:10 – 3:35 PM
Beneficial Benchmark Concentrations for Ω-3 Long Chain Poly-Unsaturated Fatty Acids (LCPUFAs) Obtained from the Seychelles Child Development Nutrition Study
Edwin vanWijngaarden, University of Rochester School of Medicine

3:35 – 3:50 PM  Break

3:50 – 4:15 PM
Stable Isotope Estimates of Mercury Burden from Dental Amalgam
Gene Watson, University of Rochester School of Medicine

4:15 – 4:35 PM
Dietary Determinants of Maternal Long-Chain Polyunsaturated Fatty Acid Status in the Seychelles Child Development Nutrition Study
J.J. Strain, University of Ulster

4:35 – 4:50 PM
Methylmercury Irreversibly Inhibits Selenoenzymes
Nicholas Ralston, University of North Dakota Energy & Environmental Research Center

4:50 – 5:30 PM
Discussants:
• Michael Aschner, Vanderbilt University
• Philip Davidson, University of Rochester School of Medicine
Finally, environmental factors, both direct and indirect, can contribute to neurological disorders. Researchers aim to understand the mechanisms of these disorders to better diagnose and treat patients. Mitochondrial dysfunction plays a significant role in neurological diseases. By amplifying evidence, researchers and clinicians can work together to develop new therapeutic approaches.

**Monday Morning 7 June 2010  8:30 AM – 9:00 AM**

**OPENING OF PLENARY SESSIONS: OVERVIEW AND RATIONALE FOR THE THEME**

**Conference Co-Chairs:** Kenneth Reuhl
Jason Richardson

8:30 – 9:00 AM

**Overview: Unifying Mechanisms of Neurological Disorders: Scientific, Translational, and Clinical Implications**

Jason R. Richardson and Kenneth R. Reuhl
Environmental and Occupational Health Sciences Institute, UMDNJ and Rutgers University

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**Monday Morning 7 June 2010  9:00 AM – 12:00 PM**

**Plenary Session**

**SESSION III: MITOCHONDRIAL DYSFUNCTION IN NEUROLOGICAL DISEASE**

**Session Chair:** Cindy Lawler
**Co-Chair:** Flint Beal

**Theme and Rationale:** Emerging evidence has linked alteration of mitochondrial function to a variety of neurological disorders. Some of these alterations arise from mitochondrial DNA mutation. However, exposure to environmental toxicants that target the mitochondria directly or indirectly have been linked to disease etiology. This session seeks to bring together clinicians, basic researchers, and those involved in translational research to evaluate the etiology and pathogenesis of neurological diseases using mitochondrial dysfunction as a unifying feature. The session will provide a state of the art overview of what is currently known about mitochondrial dysfunction in neurological disease and continue with speakers performing cutting edge research on mitochondrial function and the interaction of genetic and environmental factors in mitochondrial dysfunction. Finally, we will end with clinical observations and a discussion on how the information discussed can be used to develop translational research aimed at clinical interventions.
2:20 – 2:35 PM  
**Pre-Doctoral Competition**  
High-Throughput Assay to Assess Manganese Transport Kinetics in a Striatal Cell Model of Huntington’s Disease  
Gunnar Kwakye, Vanderbilt University Medical Center

2:35 – 3:00 PM  
**Pre-Doctoral Competition**  
Prenatal Methylmercury Exposure Induces in Rats Structural Brain Deficits at Weaning and Functional Impairment at Adult Age  
Didima de Groot, TNO Quality of Life, Zeist, The Netherlands

3:00 – 3:15 PM  
**Pre-Doctoral Competition**  
Single Postnatal Methylmercury (MeHg) Exposure Initiates Acute Stem Cell Death in Hippocampus Leading to Subsequent Neuronal Deficits and Learning Impairment.  
Katie Sokolowski, Rutgers and RWJMS

3:15 – 3:30 PM  
**Break**

3:30 – 3:55 PM  
**Selenium Prevents and Reverses Mercury Toxicity**  
Laura Raymond, University of North Dakota Energy & Environmental Research Center

3:55 – 4:20 PM  
The Effect of Aluminum Chloride on Cognitive Ability and Related Protein in apoE Knock Out Mice  
Qiao Niu, Shanxi Medical University, P.R. China

4:20 – 4:35 PM  
**Post-Doctoral Competition**  
The Effect of Aluminum Chloride on Cognitive Ability of APP/PS1 Double Transgenic Mice and Expression of mGluR1  
Qin-Li Zhang, Shanxi Medical University, P.R. China

4:35 – 4:50 PM  
**Post-Doctoral Competition**  
Arsenic Inhibits Neurite Outgrowth by Inhibiting LKB1-AMPK Signaling Pathway.  
Xin Wang, University of Kentucky

4:50 – 5:15 PM  
**In Vitro Neurotoxic Potential of Afghanistan Sand Extract**  
Palur Gunasekar, Naval Health Research Center Detachment/Environmental Health Effects Laboratory, WPAFB

5:15 PM – 7:00 PM  
**Break for Dinner on Your Own**

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**7:00 PM: Return for Poster Session and Dessert**

Monday Evening 7 June 2010 7:00 PM – 9:30 PM  
Dessert Bar & No-Host Bar  
**SESSION V: POSTER SESSION**

**Session Co-Chairs:**  
Kent Anger  
Richard Seegal  
Dongren Yang

**Poster abstracts are numbered from P-58 to P-100 and are listed on pages 8 – 12 of this Program and pages 27-47 of the Abstract Book.**

The Poster Session is a highlight of this conference series. It has proven to be an effective venue for informal, in-depth discussion and collaboration building -- as well as an important networking opportunity for all participants. Papers on any aspect of neuroscience, toxicology, children’s environmental health, public health & policy are welcome! Posters may be put up as early as 9:00 AM on Sunday and should remain up for the conference duration for maximum exposure.

**STUDENT AWARD COMPETITION**

**Co-Chairs:**  
Anumantha Kanthisamy  
Isaac Pessah

The Student Award Competition is divided into two groups: one for post-doctoral and one for pre-doctoral competition. Awards will consist of a cash prize, plaque or certificate, plus a one year subscription to the international journal NeuroToxicology. A winner(s) will be chosen from each group. Competing students are asked to give an overview of their work in 2-3 minutes to the judges followed by a brief set of questions and answers. Originality, significance, hypothesis, presentation material and style, as well as knowledge of the subject, will be considered in selecting the winners. All papers in competition for the Student Awards must be presented from poster. Judging will be done during this time.

**Judging will be done between 7:15 PM and 8:30 PM.**  
**Students please stand by your poster during this time.**

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**NTX XXVI: Unifying Mechanisms of Neurological Disorders**  
**Page 3**
GROUP I: POST-DOCTORAL COMPETITION

Chair: Anumantha Kanthasamy

Post-Doctoral Award Committees

Sub-Group A

Michael Aschner, Chair
Aaron Bowman
Cindy Lawler

Sub-Group B

Anumantha Kanthasamy, Chair
Amy Manning-Bog
Richard Seegal

Post-Doctoral Trainees

1. Diptiman Bose Mentor: Isaac N Pessah
2. Muhammad Hossain Mentor: Jason Richardson
4. Judit Marsillach Mentor: Clement E Furlong
5. April Neal Mentor: William Atchison
6. Tamara Tal Mentor: Robert L Tanguay
7. Xin Wang Mentor: Xianglin Shi
8. Linnzi Wright Mentor: Carey Pope
9. Qin-Li Zhang Mentor: Qiao Niu

GROUP II: PRE-DOCTORAL COMPETITION

Chair: Isaac Pessah

Pre-Doctoral Student Award Committees

Sub-Group A

Deborah Cory-Slechta, Chair
Toshio Narahashi
Rosemary Schuh

Sub-Group B

Isaac Pessah, Chair
Freya Kamel
Merle Paule

Pre-Doctoral Students

1. Aaron Bradford Mentor: William Atchison
2. Matthew Harris Mentor: Rosemarie Bowler
4. Gunnar Kwakye Mentor: Aaron Bowman
5. Jason Magby Mentor: Jason Richardson
6. Caroline Ritchie Mentor: Phillip J Thomas
7. Katie Sokolowski Mentor: Emanuel DiCicco-Bloom
8. Chunjuan Song Mentor: Anumantha Kanthasamy

Tuesday Morning 8 June 2010 8:30 AM – 12:00 Noon

Plenary Session

SESSION VI: PROTEIN AGGREGATION AND MISFOLDING IN NEUROLOGICAL DISEASE

Session Chair: Kenneth Reuhl
Co-Chair: Peter Spencer

Theme and Rationale: Several neurological diseases including Alzheimer's, Parkinson's, and Creutzfeldt-Jakob disease share common features involving aggregation and deposition of misfolded proteins. However, there is currently controversy as to whether this process is a cause or consequence of the disease process. This session will bring together experts in neuropathology, clinical medicine, and basic researchers to evaluate the role of protein aggregation and misfolding in neurological disease and what information that can be gleaned from examining common mechanisms affecting these pathways. Finally, we will end with clinical observations and a discussion on how the information discussed can be used to develop translational research aimed at clinical interventions.

Topics and Speakers:

8:30 – 9:00 AM
Introduction and State of the Art Overview: Protein Aggregation
Kenneth Reuhl, UMDNJ & Rutgers
Peter Spencer, Oregon Health Sciences University, Center for Global Health

9:00 – 9:30 AM
Alpha-Synuclein, LRRK2 and Environmental Factors in the Pathogenesis of Parkinson Disease and Related Neurodegenerative Disorders
Benoit Giasson, University of Pennsylvania

9:30 – 9:50 AM
Does Early-Life Genotoxin Exposure Trigger Prototypical Neurodegenerative Disease by Inducing Persistent Genomic Dysregulation? Querying DNA Repair-Deficient Mice
Peter Spencer, Oregon Health Sciences University

9:50 – 10:10 AM
Does Early-Life Genotoxin Exposure Trigger Prototypical Neurodegenerative Disease by Inducing Persistent Genomic Dysregulation? Querying Human Tau Overexpressing Mice
Glen Kisby, Oregon Health Sciences University, CROET

10:10 – 10:30 AM Break
10:30 – 11:00 AM
Role of Metals in Prion Protein Upregulation and Aggregation
Anumantha Kanthasamy, Iowa State University

11:00 – 11:20 AM
Contributions of Glycolipid-Protein Interactions to Neuronal Vulnerability in Neurodegenerative Disease Models
Amy Manning-Bog, SRI International

11:20 – 12:00 Noon
Panel Discussion and Research Recommendations
Moderators:
- Benoit Giasson, University of Pennsylvania
- Kenneth Reuhl, Environmental and Occupational Health Sciences Institute, UMDNJ & Rutgers University
- Peter Spencer, Oregon Health Sciences University, Center for Global Health

12:00 Noon – 1:30 PM Break for Lunch on Your Own

Tuesday Afternoon 8 June 2010 1:30 PM – 4:30 PM

Platform Session
SESSION VII: PESTICIDES AND SELECTED TOPICS

Session Chair: Brenda Eskenazi
Co-Chair: Charles Timchalk

1:30 – 1:55 PM
PON1, Organophosphate Exposure, and Neurodevelopment in Toddlers Living in an Agricultural Community: The Chamacos Study
Brenda Eskenazi, Center for Children’s Environmental Health Research, University of California, Berkeley

1:55 – 2:20 PM
PON1 Polymorphisms, Organophosphate (OP) Exposure, and Parkinson’s Disease (PD)
Freya Kamel, National Institute of Environmental Health Sciences/NIH

2:20 – 2:45 PM
Potential Dosimetry Implications from Localized Brain Metabolism of Organophosphorus Insecticides in the Preweanling Rat
Charles Timchalk, Pacific Northwest National Laboratory

2:45 – 3:10 PM
Pesticide Exposure and Neurobehavioral Performance in Adolescent Pesticide Applicators
Diane Rohlman, CROET, OHSU

3:10 – 3:25 PM Break

3:25 – 3:40 PM
Post-Doctoral Competition
Biomarkers of Organophosphorus (OP) Exposures in Humans
Judit Marsillach, University of Washington

3:40 – 4:05 PM
Can Comparisons of Age-Related Milestones Help Equate Maturation in Experimental Species to Human Development?
Barbara Clancy, University of Central Arkansas

4:05 – 4:30 PM
A Neurological Assessment of a Community With Ground Water Exposure To Perchloroethylene

4:30 PM – 6:30 PM Free Time

Tuesday Evening 8 June 2010 6:30 PM – 9:30 PM

Tuesday Evening, June 8th
Marriott Grand Ballroom

6:30 PM – 7:00 PM
Cocktails
(No-Host Bar)

7:00 PM – 9:30 PM
Hosted Awards Banquet
Presentation of Pre-Doctoral & Post-Doctoral Poster Awards and Travel Awards
Recognition of Sponsors

Wednesday Morning 9 June 2010 8:30 AM – 12:00 Noon

Plenary Session
SESSION VIII: EMERGING AREAS OF RESEARCH: EPIGENETIC MECHANISMS IN NEURODEVELOPMENTAL DISORDERS

Session Chair: Jason R. Richardson
Co-Chair: M. Daniele Fallin

Theme and Rationale: Although genetic factors have long been a primary focus in neurodevelopmental disorders, exhaustive candidate gene studies and genome-wide...
association studies have not identified single genes that account for more than a small proportion of the disease burden in a variety of disorders. Emerging evidence suggests that epigenetic alterations resulting from environmental exposures during critical periods of development may play a significant role in neurodevelopmental disorders. This brainstorming session is designed to assess the current state of knowledge in this emerging area and identify new opportunities and research directions to assess the role of epigenetic alterations in neurological disease. Discussion will focus on the potential for epigenetic alterations to provide insight into disease pathogenesis and ultimately, therapeutic intervention.

**Topics and Speakers:**

8:30 – 9:00 AM
**Introduction and State of the Art Overview: Epigenetics**
Helmut Zarbl, Environmental and Occupational Health Sciences Institute, UMDNJ and Rutgers University

9:00 – 9:30 AM
**Genetic Epidemiology and Epigenetics in Neurological Disorders**
M. Daniele Fallin, Johns Hopkins School of Public Health

9:30 – 10:00 AM
**Epigenetics in Neurodevelopmental Disorders and Neurotoxicology**
Jason R. Richardson, Environmental and Occupational Health Sciences Institute, UMDNJ and Rutgers University

10:00 – 10:20 AM  **Break**

10:20 – 10:50 AM
**Pre-Doctoral Competition**

**Environmental Neurotoxic Pesticide Induced Histone Acetylation and its Role in Epigenetic Mechanisms of Neurodegeneration**
Chunjuan Song, Iowa State University

10:50 – 11:20 AM
**Early Childhood Lead Exposure Alters the DNA Methylation Pattern in Children**
Douglas M. Ruden, Wayne State University

11:20 – 12:00 Noon
**Panel Discussion/Brainstorming**

Moderators:
- M. Daniele Fallin
- Jason Richardson

12:00 Noon – 1:30 PM  **Break for Lunch on Your Own**

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**Wednesday Afternoon 9 June 2010 1:30 PM – 5:30 PM**

**Symposium**

**SESSION IX: NEUROTOXIC EFFECTS OF ENVIRONMENTAL EXPOSURE TO MANGANESE IN CHILDREN AND ADULTS**

**Session Chair:** Donna Mergler, University of Quebec at Montreal, Canada

**Co-Chair:** Roberto Lucchini, University of Brescia, Italy

**Theme and Rationale:** Since Couper first identified manganese intoxication in 1837, there have been hundreds of reports of neurologic disorders and neurobehavioral deficits due to high levels of occupational exposure to manganese. Since manganese is an essential element and subject to homeostatic control, there has been little concern about possible neurotoxic effects of environmental exposure through air and water. Recent studies with children and adults living in the vicinity of manganese mines and processing plants and with children exposed to manganese through drinking water, suggest that environmental manganese exposure is associated with loss of nervous system function. This is an emerging field and many questions still need to be answered: What are the effects throughout the lifespan? What is the contribution of in utero exposure? What is the most adequate biomarker of exposure? Are current guidelines protective for health? In this session, researchers from several countries present their studies on environmental exposure to manganese.

1:30 – 2:00 PM
**Neurobehavioral Effects of Inhaled Manganese in Italian Adolescents**
Roberto Lucchini, University of Brescia, Italy

2:00 – 2:30 PM
**Elevated Manganese Affects Mothers’ and Children’s Cognition.**
Jose Antonio Menezes Filho, Universidade Federal da Bahia, Brazil

2:30 – 3:00 PM
**Effects of Environmental Exposure to Manganese on Motor Function of Children in Mexico**
Horacio Riojas Rodriguez, Instituto Nacional de Salud Publica, Mexico

3:00 – 3:20 PM  **Break**

3:20 – 3:50 PM
**Methodological Aspects of an Epidemiologic Study of Adults Living Near a Manganese Point Source**
Rosemarie Bowler, San Francisco State University
3:50 – 4:05 PM
**Relationships Between Mood and Neuropsychological Performance in Adults with Environmental Exposure to Manganese**
Matthew Harris, San Francisco State University

4:05 – 4:35 PM
**Intellectual Impairment in School-Age Children with Long-Term Exposure to Manganese in Drinking Water**
Maryse Bouchard, CINBIOSE, Université du Québec à Montréal, Canada

4:35 – 5:05 PM
**Birth Cohort Study GESTE: Can Cord Blood Biomarkers Tell Us How Low Dose Neurotoxic Metals Affect the Foetal Brain? First Data on Prolactin and Monoamine Oxidase.**
Nadia Abdelouahab, University of Quebec at Montreal, Canada

5:05 – 5:30 PM
**Panel Discussion**

### Wednesday Evening 9 June 2010

**Free Evening**

Walk across the Parkway to Waterfront Park and enjoy the unique Annual Portland Rose Festival/Waterfront Village.

Nestled between Portland's bustling downtown business district and the scenic Willamette River covering the length of the Governor Tom McCall Waterfront Park, the Waterfront Village provides a park-load of whimsical kids adventures, hysterical vaudevillian acts, festive bands, and thousands of smiling families each day. This magical world of wonder also features a mysterious ancient temple, live exotic animals (including lions and tigers but no bears, oh no) and the region's best family-friendly carnival. So the Waterfront Village really is Portland's Place to Play for all who are young at heart. Come tour our ancient temple that is being transported from lands lost in time.

[http://www.rosefestival.org/events/waterfrontvillage/](http://www.rosefestival.org/events/waterfrontvillage/)

### Thursday Morning 10 June 2010 8:30 AM – 12:00 Noon

**Keynote “Anchor Talks”**

**SESSION X: HOT TOPIC KEYNOTES: CHANNELOPATHIES**

*Session Chair:* Timothy Shafer  
*Co-Chair:* April Neal

**Theme and Rationale:** Ion channels are the most basic elements of neuronal function and are key players in the proper function of the nervous system. In order to conduct these functions, channel proteins must exhibit proper structure, localization, and expression. Dysregulation of any of these processes may contribute to pathophysiology and result in what generally are known as channelopathies. The vast majority of research on channelopathies has focused on organ systems such as the heart, with recent focus starting to explore the role of channelopathies in neurological disorders such as epilepsy, chronic pain, and migraine. With this emerging area of research, most of the focus has been on the role of genetic alterations in channel proteins. However, a variety of environmental toxicants target ion channels, which suggests the potential for environmental exposures to contribute to neurological disease associated with alterations in ion channels. This workshop will bring together experts in ion channel structure and function, toxicologists studying environmental toxicant interactions with ion channels, and experts in clinical medicine and translational research to define the state of the science of channelopathies and the potential role of environmental exposures in channelopathies. This session will present an overview of effects of chemicals on ion channels, background about different channelopathy models, and explore the possibility that individuals with channelopathies may or may not be more sensitive to effects of chemicals.

**Topics and Speakers:**

8:30 – 9:00 AM
**Introduction and State of the Art Overview: Channelopathies**
Timothy Shafer, US Environmental Protection Agency

**Do Ion Channelopathies Constitute a Gene X Environment Interaction for Environmental Neurotoxicants?**
Timothy Shafer, US Environmental Protection Agency

9:00 – 9:30 AM
**Overview of Environmental Toxicants Affecting Ion Channel Function**
Toshio Narahashi, Northwestern University

9:30 – 10:00 AM
**Calcium Channels as Targets of Environmental Toxicants and Neurological Disease**
William Atchison, Michigan State University

10:00 – 10:20 AM  Break
10:20 – 10:50 AM
**Ryanozine Receptor Channelopathies Are Triggered by Environmental Cues**
Isaac Pessah, University of California, Davis

10:50 – 11:10 AM
**Post-Doctoral Competition**
**Ablethrin Differentially Modulates Voltage-Gated Calcium Channel Subtypes in Rat PC12 Cells**
April P. Neal, Michigan State University

11:10 – 11:30 AM
**Pre-Doctoral Competition**
**Deltamethrin Exposure Results in Calpain/Proteasomal Dependent Down-Regulation of Voltage Gated Sodium Channel Expression**
Jason P. Magby, Rutgers University and University of Medicine and Dentistry of New Jersey

11:30 – 12:00 Noon
**Panel Discussion**
**Moderators:**
- Isaac Pessah
- William Atchison

12:00 Noon – 1:30 PM **Break for Lunch on Your Own**

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**Thursday Afternoon 10 June 2010 1:30 PM – 3:15 PM**

**Keynote “Anchor Talks”**

**SESSION XI: HOT TOPIC KEYNOTES: GENDER DIFFERENCES IN NEUROLOGICAL DISORDERS**

**Session Chair:** Bernard Weiss  
**Co-Chair:** Richard Seegal

**Theme and Rationale:** The IOM report, Does Sex Matter (2001) emphasized the need for examining differences between male and female responses in the research enterprise because of wide gaps between males and females in disease patterns and in response to therapeutic practices and drugs. This platform session is designed to exemplify both current knowledge of sex differences in environmental chemical vulnerability and to propose insight into the relationship between the environmental exposures, gender, and the development of neurological dysfunction that may lead to a number of neurological diseases or disorders. Platform presentations will include basic, clinical, and translational research aimed at highlighting the integral role of gender in neuronal function and disease disparities and how environmental exposures interact with gender to alter risk of neuronal dysfunction.

**Topics and Speakers:**

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1:30 – 2:00 PM
**Introduction and State of the Art Overview: Gender Differences in Neurological Disorders and Response to Environmental Exposures**
Deborah Cory-Slechta, University of Rochester School of Medicine and Dentistry

2:00 – 2:30 PM
**Sexually Dimorphic Effects of PCBs: From Development to Neurodegeneration**
Richard Seegal, New York State Department of Health

3:00 – 3:15 PM
**Discussion**
**Moderators:**
- Bernard Weiss
- Richard Seegal

3:15 – 3:30 PM **Break**
The following papers are presented in

**SESSION V: POSTER SESSION**

**Monday Evening, June 7, 2010**

**7:00 – 9:30 PM**

**STUDENT AWARD COMPETITION**

Judging will be done between 7:15 PM – 8:30 PM

Students please stand by your poster during this time.

**MECHANISTIC APPROACHES TO METAL NEUROTOXICITY**

**P-58**

**SELENIUM FROM OCEAN FISH PREVENTS MERCURY TOXICITY.** CR Ralston and NVC Ralston. University of North Dakota Energy & Environmental Research Center, 15 North 23rd Street, Grand Forks ND, 58202 USA

**P-59**

**Pre-Doctoral Poster Award Competition**

**METHYLMERCURY-ASSOCIATED FLUO4 FLUORESCENCE IS REDUCED BY THE GABA A AGONIST MUSCIMOL IN NEONATAL RAT CEREBELLAR SLICES.** AB Bradford and WD Atchison. 1Department of Biochemistry/Molecular Biology, 2Center for Integrative Toxicology and 3Department of Pharmacology/Toxicology, Michigan State University, East Lansing, MI, USA.

**P-60** (Also presented from Platform in Session IV)

**Post-Doctoral Poster & Travel Award Competition**

**ARSENIC HINIBITS NEURITE OUTGROWTH BY INHIBITING LKB1-AMPK SIGNALING PATHWAY.** Xin Wang, Dan Meng, Qingshan Chang, Jingju Pan, Zhuo Zhang, Gang Chen, Junji Ke, Jia Luo, and Xianglin Shi. 1Graduate Center for Toxicology, University of Kentucky, Lexington, KY 40536 USA 2Key Laboratory of Nutrition and Metabolism Institute, Institute for Nutritional Sciences, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai, 200031, P.R. China 3Department of Internal Medicine, University of Kentucky, Lexington, KY 40536 USA

**P-61** (Also presented from Platform in Session IV #20)

**Post-Doctoral Poster & Travel Award Competition**

**THE EFFECT OF ALUMINUM CHLORIDE ON COGNITIVE ABILITY OF APP/PS1 DOUBLE TRANSGENIC MICE AND EXPRESSION OF mGlur1.** ZHANG Qin-Li1, JIAO Xia1, JI Xiuliang1, Ce Zhang2 and NIU Qiao3. Ministry of Education Key Laboratory, 1Department of Occupational Health, Shanxi Medical University, Taiyuan 030001 P.R. China; Ministry of Education Key Laboratory, 2Department of Physiology, Shanxi Medical University, Taiyuan 030001 P.R. China

*Corresponding author

**P-62**

**Pre-Doctoral Poster & Travel Award Competition**

**ARSENITE INHIBITS NEURITE GROWTH THROUGH MODULATION OF THE ACTIN CYTOSKELETON.** DJ Swett1,2 and DA Currie1,2. 1Maine Center for Toxicology and Environmental Health, and 2Biology Department, University of Southern Maine, Portland, Maine, USA; 3Department of Molecular and Biomedical Sciences, University of Maine, Orono, Maine, USA.

**P-63**

**LOW LEVEL LEAD EXPOSURE AND INFLAMMATORY CYTOKINES IN THE BRAINS OF C57BL/6 MICE.** M Cervantes, RX Armijos and C Sobin. Department of Public Health Sciences, the University of Texas at El Paso, El Paso, Texas

**METALS IN HUMAN POPULATIONS**

**P-64** (Also presented from Platform in Session IX #45)

**Pre-Doctoral Poster & Travel Award Competition**

**RELATIONSHIPS BETWEEN MOOD AND NEUROPSYCHOLOGICAL PERFORMANCE IN ADULTS WITH ENVIRONMENTAL EXPOSURE TO MANGANESE.** Harris, M1; Bowler, R2. 1Alliant International University, San Francisco, CA; 2San Francisco State University

**P-65**

**OCCUPATIONAL DIFFERENCE IN MEMORY PERFORMANCE.** Hage, D., Leary B., Bowler, R. San Francisco State University

**P-66**

**THE INFLUENCE OF DIETARY CONSUMPTION AND IRON STORES ON MANGANESE IN BLOOD.** R Rasalan and R Bowler. San Francisco State University, San Francisco, CA, USA
P-67
MERCURY IN FISH: WHAT’S A SAFE LEVEL? SG Gilbert. Institute of Neurotoxicology & Neurological Disorders, Seattle, WA, USA

P-68
RELATIONSHIPS BETWEEN OBESITY, MANGANESE, AND HEALTH IN ADULTS WITH ENVIRONMENTAL EXPOSURE TO MANGANESE. Wilson K, Gocheva V, Bowler R. 1Alliant International University, 2San Francisco State University

P-69
RELATIONSHIP BETWEEN LOW-LEVEL LEAD EXPOSURE AND PHYSICAL GROWTH IN CHILDREN OF EL PASO, TEXAS. Alma Ortega, MD and Christina Sobin, PhD. Laboratory of Neurocognitive Genetics and Developmental Neurocognition, Psychology Department, University of Texas at El Paso, US

P-70
THE POSSIBLE PROTECTIVE EFFECTS OF ACTIVE BILINGUALISM IN CHILDREN EXPOSED TO LOW LEVEL LEAD, AS MEASURED BY THE SIMON TASK. Marisela Gutierrez and Christina Sobin. Department of Psychology, University of Texas at El Paso, El Paso, Texas, US

INSECTICIDE NEUROTOXICITY: MECHANISMS AND POPULATIONS

P-71
ORGANOPHOSPHATE (OP) PESTICIDES INDUCE OXIDATIVE STRESS AND OXIDATIVE DNA DAMAGE IN HUMAN SH-SY5Y NEUROBLASTOMA CELLS. Juan F. Muniz, Linda A. McCauley, and Glen E. Kisby. 1University of Pennsylvania-School of Nursing, Philadelphia PA 19104-6096, USA; 2Emory University, Atlanta, GA; 3Center of Research on Occupational & Environmental Toxicology (CROET), Oregon Health & Science University, Portland, OR 97239, USA

P-72 (Also presented from Platform in Session IV #54)
Pre-Doctoral Poster & Travel Award Competition
DELTAMETHRIN EXPOSURE RESULTS IN CALPAIN/PROTEASOMAL DEPENDENT DOWN-REGULATION OF VOLTAGE GATED SODIUM CHANNEL EXPRESSION. Jason P. Magby, Jason R. Richardson. 1Environmental and Occupational Health Sciences Institute and Department of Environmental and Occupational Medicine, Robert Wood Johnson Medical School. 2Joint Graduate Program in Toxicology, Rutgers University, University of Medicine and Dentistry of New Jersey

P-73 (Also presented from Platform in Session X #53)
Post-Doctoral Poster & Travel Award Competition
ALLETHRIN DIFFERENTIALLY MODULATES VOLTAGE-GATED CALCIUM CHANNEL SUBTYPES IN RAT PC12 CELLS. April P. Neal, Yuan Yukun, and William D. Atchison. Department of Pharmacology & Toxicology, Michigan State University, East Lansing, MI USA

P-74
Post-Doctoral Poster & Travel Award Competition
N-ISOPROPYLCYRAMIDE INCREASES ACETYLCHOLINE RELEASE IN RAT STRIATAL SLICES. LKM Wright, J Liu and CN Pope. Department of Physiological Sciences, Center for Veterinary Health Sciences, Oklahoma State University, Stillwater, OK, USA

P-75
Post-Doctoral Poster & Travel Award Competition
MECHANISM OF PYRETHROID PESTICIDE-INDUCED APOPTOSIS: ROLE OF THE ER STRESS PATHWAY AND CALPAIN ACTIVATION. M. M. Hossain and J. R. Richardson. Department of Environmental and Occupational Medicine, Environmental and Occupational Health Sciences Institute, Robert Wood Johnson Medical School, Piscataway, NJ 08854, USA

P-76
CHLORPYRIFOS DISRUPTS NEUROLIGEN-MEDIATED SYNAPSE FORMATION. Dongren Yang and Pamela Lein. Department of Molecular Biosciences, School of Veterinary Medicine, University of California, Davis, CA, 95616, USA

P-77
CHANGES IN THE ACTIVITY OF SEROTONERGIC NEURONS FOLLOWING ACUTE EXPOSURE TO ORGANOPHOSPHATE PESTICIDES. R Dodds, PG Blain & SJ Judge. The Medical Toxicology Centre, Wolfson Unit, Newcastle University, Newcastle upon Tyne, UK.

P-78
COMPOUNDS-SPECIFIC EFFECTS OF MUTATIONS AT V787 IN DII-S6 OF NAV1.4 SODIUM CHANNELS ON INHIBITION BY SODIUM CHANNEL BLOCKER INSECTICIDES (SCBIS). R.T. von Stein and D.M. Soderlund. Department of Entomology, Cornell University, Geneva, NY, USA.
P-79
NEUROBEHAVIORAL EVALUATION OF CHILDREN LIVING IN AN AGRICULTURAL COMMUNITY. DS Rohlman, E Hohn, T Moomey, A Kirk, S Huszar. Center for Research on Occupational and Environmental Toxicology, Oregon Health & Science University, Portland, OR 97239.

P-80  (Also presented from Platform in Session VII #33)
Post-Doctoral Poster & Travel Award Competition
BIOMARKERS OF ORGANOPHOSPHORUS (OP) EXPOSURES IN HUMANS. J Marsillach1,2, RJ Richter1,2, JH Kim3, RC Stevens1,2, MJ MacCoss7, D Tomazela5, SM Suzuki1,2, LM Schopfer1, O Lockridge5, CE Furlong1,2. Univ. of Washington, Departments of Medicine (Div. Medical Genetics), Genome Sciences, Anesthesiology, Seattle, WA, University of Nebraska Medical Center, Omaha, NE

P-81  (Also presented from Platform in Session VIII #39)
Pre-Doctoral Poster & Travel Award Competition
ENVIROMENTAL NEUROTOXIC PESTICIDE INDUCED HISTONE ACETYLATION AND ITS ROLE IN EPIGENETIC MECHANISMS OF NEURODEGENERATION. Song C, Kanthasamy A, Anantharam V, Sun F, Kanthasamy AG. Iowa Center for Advanced Neurotoxicology, Department of Biomedical Sciences, Iowa State University, Ames, IA 50011, USA.

MODELING NEUROLOGICAL DISORDERS

P-82
Pre-Doctoral Poster Award Competition
MECHANISM OF PRODUCTION OF SPECIFIC ALPHA-SYNUCLEIN C-TERMINAL TRUNCATIONS AND IMPLICATIONS TO DISEASE. Caroline M. Ritchie1, Karen A. Lewis1, Yang Su33, Olina Jou2,3, Charles L. White III1,3, Kimmo J. Hatanpaa1,3, George N. DeMartino1, Philip J. Thomas1. Departments of Physiology, Pathology, and the Alzheimer’s Disease Center, University of Texas Southwestern School of Medicine, Dallas, TX, USA

P-83  (Also presented from Platform in Session IV #15)
Pre-Doctoral Poster & Travel Award Competition
HIGH-THROUGHPUT ASSAY TO ASSESS MANGANESE TRANSPORT KINETICS IN A STRIATAL CELL MODEL OF HUNTINGTON’S DISEASE. GF Kwakye, D Li, AB Bowman. Dept. of Neurology, Vanderbilt Kennedy Center. Vanderbilt University Medical Center. Nashville, TN, USA

P-84
EFFECT OF CHRONIC MPTP ADMINISTRATION ON GLYCOYSIS AND TCA CYCLE PATHWAYS IN MOUSE MODEL OF PARKINSON’S DISEASE. Bakary J Sonko1, Tom Schmitt1, Laszlo Boros3, Sumit Sakar2, Ali Syed2 and Richard Beger1. 1 Division of Systems Biology, NCTR, FDA, Jefferson, AR USA; 2 Division of Neurotoxicology, NCTR, FDA, Jefferson, AR USA; 3 Sidmap LLC. 2990 S. Sepulveda Blvd, Los Angeles, CA, USA

P-85
RESVERATROL PROTECTS AGAINST MPP+ AND METHAMPHETAMINE NEUROTOXICITY BY MODULATING THE PKC8 APOPTOTIC SIGNALING PATHWAY AND MICROGLIAL ACTIVATION. K. Kanthasamy*, R. Gordon, C. Hogan, V. Anantharam, A.G. Kanthasamy, and A. Kanthasamy, Parkinson’s Disorder Research Laboratory, Dept. of Biomedical Sciences, Iowa State University, Ames, IA 50011-1250

P-86
USING A BIOMARKER OF OXIDATIVE STRESS TO DETERMINE SYNERGISTIC INTERACTIONS BETWEEN IRON AND PARAQUAT. T. Brown, F. Cardozo-Pelaez. Center for Environmental Health Sciences. Department of Biomedical and Pharmaceutical Sciences, The University of Montana, Missoula, Montana, USA

DEVELOPMENTAL NEUROTOXICITY

P-87  (Also presented from Platform in Session IV #17)
Pre-Doctoral Poster & Travel Award Competition
SINGLE POSTNATAL METHYLMERCURY (MEHG) EXPOSURE INITIATES ACUTE STEM CELL DEATH IN HIPPOCAMPUS LEADING TO SUBSEQUENT NEURONAL DEFICITS AND LEARNING IMPAIRMENT. K. Sokolowski1,2 Kelsey Robinson1 and E. DiCicco-Bloom1,2 Joint Graduate Program in Toxicology, Rutgers1; Neurosci & Cell Biol, RWJMS, Piscataway, NJ2

P-88
Post-Doctoral Poster & Travel Award Competition
MICROMANAGING BRAIN DEVELOPMENT AND FUNCTION: ETHANOL-INDUCED NEUROBEHAVIORAL TOXICITY IN ZEBRAFISH. TL Tal, JA Franzosa, KS Saili, and RL Tanguay. Department of Environmental and Molecular Toxicology, Oregon State University, Corvallis, Oregon, USA
P-89
EARLY POSTNATAL ANESTHESIA AND LONG LASTING COGNITIVE DEFICITS IN RHESUS MONKEYS. M. G. Paule1, M. Li1, X. Zou1, C. Hotchkiss3, J.P. Hanig1, T.A. Patterson, W. Slikker, Jr.1 and C. Wang1. 1Division of Neurotoxicology, National Center for Toxicological Research, FDA, 2Bionetics Corporation, Jefferson, AR, and 3Center for Drug Evaluation and Research, FDA, Rockville, MD

P-90
AGE-DEPENDENT CHANGES IN THE NIGROSTRIATAL SYSTEM AND MOTOR BEHAVIOR IN MICE DEFICIENT IN THE DNA REPAIR ENZYME M.Y., Sanchez-Contreras, L.L., Bolyard, J.A., Lyda and F. Cardozo-Pelaez. Center for Environmental Health Sciences. Department of Biomedical and Pharmaceutical Sciences, The University of Montana, Missoula, Montana, USA

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P-92 (Also presented from Platform in Session IV #16)
PRENATAL METHYLMERCURY EXPOSURE INDUCES IN RATS STRUCTURAL BRAIN DEFICITS AT WEANING AND FUNCTIONAL IMPAIRMENT AT ADULT AGE. D. de Groot1, M. Radonjic3, M. Bogaard1, N. Cappaert1, R. Dierckx1, F. Kuper1, R. Nederlof1, M. Verwei1, B. Voet1, E. de Vries2, A. van Waarde2, W. Wadman3, A. Wolterbeek1, R. Stierum1. 1TNO Quality of Life, Zeist, The Netherlands; 2University Medical Center Groningen, PET Center Groningen, The Netherlands; 3University of Amsterdam, the Netherlands

ENDOCRINE SYSTEMS AND RECEPTOR ACTIVATION

P-93
Pre-Doctoral Poster & Travel Award Competition
NEUROPROTECTIVE EFFECTS OF ESTRADIOL ON ALTERED AGE RELATED NEURONAL MARKERS IN AGING FEMALE RATS. Pardeep Kumar, R.K. Kale, S.M.Cowsik and N. Z. Baquer. School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067, India

P-94
Post-Doctoral Poster & Travel Award Competition
PARA-SUBSTITUTION IS A KEY DETERMINANT OF BROMINATED DIPHENYL ETHER ACTIVITY TOWARD RYANODINE RECEPTORS KH Kim, DD Bose, J Riehl, IT Padilla, CD Barnhart, PJ Lein, and IN Pessah. Department of Molecular Biosciences, The School of Veterinary Medicine, University of California, Davis, USA

P-95
EFFECTS OF DIBP ON BEHAVIOR OF LEARNING AND MEMORY IN THE MALE MOUSE. Ma Ning, Student, and Xu Hai-bin, Advisor. National Institute of Nutrition and Food Safety, China CDC, Beijing ,china

P-96
Post-Doctoral Poster & Travel Award Competition
NANOMOLAR NON-COPLANAR PCB 95 INCREASES SPONTANEOUS SYNCHRONIZED Ca2+ OSCILLATIONS AND DENDRITIC GROWTH IN PRIMARY HIPPOCAMPAL NEURONS. DD Bose, D Yang, ES Kaplan, PJ Lein and IN Pessah. Department of Veterinary Molecular Biosciences, University of California, Davis, CA, USA.

RISK IDENTIFICATION

P-97
THE WORLD LIBRARY OF TOXICOLOGY (WLT): A GLOBAL COMMUNITY OF TOXICOLOGISTS SERVING PUBLIC HEALTH. SG Gilbert1, P Wexler2, EM Faustman3, and N Thorp1. 1Institute for Neurotoxicology and Neurological Disorders, Seattle, WA, USA. 2National Library of Medicine, Bethesda, MD, USA. 3University of Washington, Seattle, WA, USA.

P-98
EXAMINING THE RELATIONSHIP OF SELF-REPORTED DIAGNOSED ILLNESSES AND MEDICATION USE. Warren,M,4; Bowler,R1;; Kim,Y3;; Booty,A4. 1 San Francisco State University 2University of Ulsan College of Medicine 4University of California San Francisco

P-99
IDENTIFICATION OF TOXICITY PER DNA ADDUCTS FOLLOWED BY TREATMENT WITH PHOSPHOLIPID EMULSION. Kane PC, Speight MO, Bieber K, Pouria S, McLaren-Howard J, Milz M. NeuroLipid Research Foundation, 45 Reese Road, Millville, NJ 08332 USA

P-100
HYPOXIA HAZARDS FROM SULFUR DIOXIDE DERIVED FROM SHRIMP DIP. MF Cramer, PhD, CIH, ATS and BW Rodgers, MS, Department of Environmental and Occupational Health, College of Public Health, University of Arkansas for Medical Sciences.