The Exposome and the Developing Brain

LeFrak Auditorium, Price Center, Room 151
9:15am, Monday, May 16th, 2011

SYMPOSIUM OUTLINE:

08:45am  Breakfast (Price Center, lobby below the LeFrak Auditorium)
09:15am  Welcome and Program Overview
          Steve Walkley, DVM, Ph.D., Director, RFK-IDDRC, Albert Einstein College of Medicine,
                   New York, USA
09:20am  Title: Neuroimaging of the Brain Basis for Fetal Alcohol Spectrum Disorders
          Speaker: Claire D. Coles, Ph.D., Director, Maternal Substance Abuse and Child Development Laboratory,
                    Professor, Psychiatry and Behavioral Sciences, Pediatrics, Emory University School of Medicine,
                    Georgia, USA
09:50am  Title: Early Life Exposure to Environmental Chemicals and Neurodevelopment
          Speaker: Julie B. Herbstman, Ph.D., Sc.M., Director, World Trade Center Pregnancy Study,
                    Assistant Professor, Environmental Health Sciences, Columbia University,
                    New York, USA
10:20am  Title: Epigenetic Markers of Intrauterine Conditions and Disease Susceptibility
          Speaker: Francine H. Einstein, M.D., Associate Professor, Department of Obstetrics & Gynecology and
                    Women’s Health, Department of Medicine, Albert Einstein College of Medicine,
                    New York, USA
10:40am  Coffee Break (Price Center, lobby below the LeFrak Auditorium)
11:00am  Title: Impact of Obesity and Metabolic Disease on the Developing Adolescent Brain
          Speaker: Antonio Convit, M.D., Professor, Department of Psychiatry, Department of Medicine,
                    New York University School of Medicine, New York, USA
11:30am  Title: NIH Hispanic Community Health Study/Study of Latinos (HCHS/SOL)
          Speaker: Robert C. Kaplan, Ph.D., Professor, Department of Epidemiology and Population Health,
                    Albert Einstein College of Medicine, New York, USA
11:50am  Title: Growing-Up Healthy: Self-Regulation. A Model for Risk and Resilience
          Speaker: Carmen R. Isasi, M.D., Ph.D., Assistant Professor, Department of Epidemiology and Population Health,
                    Albert Einstein College of Medicine, New York, USA
12:10pm  Discussion with Speaker Panel
12:30pm  Meeting adjourns
The RFK-IDDRC Research-Cluster Workshop Series:

As part of the renewed research program of the Rose F. Kennedy Center, four major thematic areas of research emphasis and strength have been identified:

(1) Nutritional & Environmental Determinants of Brain Development
(2) Autism Spectrum Disorders
(3) Neurogenetic and Seizure Disorders
(4) Deafness and Communication Disorders

Within each of these clusters we have identified significant existing strengths at Einstein and it is the express mission of the RFK-IDDRC to continue to expand and strengthen these research areas. As part of our ongoing efforts to foster innovation, communication and collaboration, we will host a workshop day centered on one of these four major themes twice each year. The intention of these workshops is to provide a longer and more interactive format than a typical research seminar, whereby IDDRC investigators and clinicians can exchange ideas, consolidate collaborations and learn of each other's work. We are delighted to welcome you to the first of these workshops which specifically addresses the "Nutritional & Environmental Determinants of Brain Development" theme. We are very grateful to our colleague, Dr. Francine Einstein, for her work in designing today's exciting program, and to all of our speakers, both internal and external, for their participation. We hope that the day proves both enriching and stimulating.

Steven U. Walkley (Director) & John J. Foxe (Assoc. Director)

Abstracts

Title: Neuroimaging of the Brain Basis for Fetal Alcohol Spectrum Disorders
Speaker: Claire D. Coles, Ph.D., Director, Maternal Substance Abuse and Child Development Laboratory Professor, Psychiatry and Behavioral Sciences, Pediatrics, Emory University School of Medicine, Georgia, USA

Abstract:
The teratogenic impact on the Central Nervous System (CNS) of prenatal exposure to alcohol has been recognized for many years. While previous evidence has come from animal models, post mortem anatomical studies, and altered neurobehavioral outcomes in offspring, with the advances in neuroimaging methods over the last two decades, it is now possible to observe these effects in the living human brain. In this presentation, current findings on the impact of prenatal alcohol exposure on brain structure, microstructure and function will be briefly reviewed with examples from a longitudinal cohort of young adults first identified prenatally. Alcohol exposure and a diagnosis of fetal alcohol syndrome are associated with the reductions in brain volume as well as in specific areas in brain, particularly in the corpus callosum and relative deficits in white versus grey matter. On a microstructural level, Diffusion Tensor Imaging studies indicate significant attenuation of white matter integrity. Functional MRI studies find alterations in BOLD responses during cognitive tasks in alcohol-exposed individuals. Factors that influence research on these topics will be discussed including poly drug exposure, post natal diagnosis and confirmation of maternal use and gestational exposure.

Title: Early Life Exposure to Environmental Chemicals and Neurodevelopment
Speaker: Julie B. Herbstman, Ph.D., Sc.M., Director, World Trade Center Pregnancy Study, Assistant Professor, Environmental Health Sciences, Columbia University, New York, USA

Abstract:
In humans, brain development begins early in gestation and continues throughout early childhood and adolescence. Environmental exposures during these windows of increased susceptibility may be especially damaging to the developing brain. At the Columbia Center for Children's Environmental Health, we prospectively follow children from gestation through adolescence to examine the impacts of environmental exposures on neurodevelopment. In our cohorts, we have observed significant associations between prenatal and early childhood exposure to developmental neurotoxicants including pesticides, combustion-related air pollutants, plasticizers, and flame retardant compounds on child cognition and behavior. Taking a molecular epidemiological approach, our work now aims to understand the biological mechanisms underlying these associations.
Title: Epigenetic Markers of Intrauterine Conditions and Disease Susceptibility  
Speaker: Francine H. Einstein, M.D., Associate Professor, Department of Obstetrics & Gynecology and Women’s Health, Department of Medicine, Albert Einstein College of Medicine, New York, USA  
Abstract: Perturbations of the intrauterine environment can have major effects in determining long-term disease susceptibility. Although the mechanisms for this remain incompletely understood, permanent alterations in gene expression implicate epigenetic regulation as the biological memory of early life conditions. We use a high-resolution genome-wide DNA methylation profiling assay to comprehensively characterize cytosine methylation levels in a single, accessible population of human multipotent stem cells isolated from umbilical cord blood of neonates with normal and abnormal intrauterine growth. Understanding the importance of early life development may support a life cycle perspective of health and chronic adult disease and emphasize the basis for prioritization of prevention.

Title: Impact of Obesity and Metabolic Disease on the Developing Adolescent Brain  
Speaker: Antonio Convit, M.D., Professor, Department of Psychiatry, Department of Medicine, New York University School of Medicine, New York, USA  
Abstract: Obesity in the US has reached “epidemic” proportions. The rates of childhood obesity are also increasing rapidly. Obesity is associated with several other conditions, but most importantly metabolic disease. Up until recently little was known about the impact of obesity and metabolic disease on brain function and structure. There is compelling emerging data documenting that during adolescence, a developmental period of ongoing brain maturation, obesity and metabolic disease reduce cognitive performance and result in structural brain abnormalities including specific regional brain volume loss and reductions in white matter microstructural integrity. Mechanisms for these ill effects will be discussed.

Title: NIH Hispanic Community Health Study/Study of Latinos (HCHS/SOL)  
Speaker: Robert C. Kaplan, Ph.D., Professor, Department of Epidemiology and Population Health, Albert Einstein College of Medicine, New York, USA  
Abstract: The NIH Hispanic Community Health Study / Study of Latinos (HCHS/SOL) is a multi-center epidemiologic study in Hispanic/Latino populations to determine the role of acculturation in the prevalence and development of disease, and to identify risk factors playing a protective or harmful role in Hispanics/Latinos. Major areas of research include heart disease, stroke, obesity, asthma and other pulmonary diseases, hearing disorders, sleep disorders, and oral/periodontal disease. Dr. Kaplan is Principal Investigator of the study's Bronx, NY field center.

Title: Growing-Up Healthy: Self-Regulation. A Model for Risk and Resilience  
Speaker: Carmen R. Isasi, Ph.D., Assistant Professor, Department of Epidemiology and Population Health, Albert Einstein College of Medicine, New York, USA  
Abstract: Dr. Isasi will discuss the role of effortful control and impulsivity on adolescent's health and risk behaviors. Results from the Nutrition, Activity, and Health will be presented. This study enrolled 1800 adolescents from 11 schools in the Bronx and examined the association of self-regulation skills with weight-related behaviors in this sample of inner-city adolescents.
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