

PARTNERSHIP FOR PEDIATRIC EPILEPSY RESEARCH

A collaborative program of the American Epilepsy Society, Epilepsy Foundation and Parents Against Childhood Epilepsy

AWARDS FY08- EACH \$75,000

- Investigator:** Janelle Wagner, Ph.D.
Title: Assistant Professor of Pediatrics and Nursing
Institution: Medical University of South Carolina
Project Title: Depression Screening in Youth with Epilepsy
William R. Turk, M.D. Pediatric Epilepsy Research Award
- Summary:** Children with epilepsy are more likely to have depressive symptoms and thoughts of suicide. However, depressive symptoms are often overlooked and these children do not receive mental health treatment. Thus, the proposed study addresses these problems by 1) revising an adult depression screening tool; 2) validating this depression screening tool; and 3) helping with access to mental health care providers for youth ages 12-17 with epilepsy. In this study, youth and parents will complete written surveys and telephone interviews. Youth will be referred for mental health treatment as needed, and this process will be tracked.
- Investigator:** Lori L. Isom, Ph.D.
Title: Professor
Institution: University of Michigan
Project Title: Role of sodium channel SCN1B subunits in pediatric epilepsy
Summary: Na⁺ channels regulate electrical activity in brain. Inherited disorders of Na⁺ channels cause epilepsy in humans. Mutations in $\beta 1$ (SCN1B) cause generalized epilepsy with febrile seizures plus type 1 (GEFS+1), a syndrome that displays multiple seizure types in different families. Epilepsy syndromes in GEFS+ families include febrile seizures, febrile seizures plus, mild generalized epilepsies, severe myoclonic epilepsy of infancy, temporal lobe epilepsy, and frontal lobe epilepsy. GEFS+ has also been identified in families bearing mutations in the Na⁺ channel α subunit gene SCN1A, as well as the GABAA receptor gene GABRG2. SCN1A, SCN1B, and GABRG2 may be functionally linked in the brain, as mutations in any of these genes can result in GEFS+. The goal of this research is to test the hypothesis that this epilepsy occurs through decreased Na⁺ current mediated by SCN1A channels in GABAergic neurons. The results of this research will contribute to the understanding of the role of SCN1B in normal brain function as well as a greater understanding of how mutations in this gene lead to human pediatric epilepsy.
- Investigator:** Tianfu Li, Ph.D.
Title: Postdoctoral Fellow
Institution: Legacy Research
Project Title: High neuronal adenosine kinase expression as risk factor for febrile seizure-induced epileptogenesis
Summary: Prolonged febrile seizures during childhood are considered to be a major cause for the subsequent development of epilepsy. This project is based on findings that the brains' own adenosine-based seizure control system is not yet fully developed during childhood. In particular, high levels of the adenosine removing enzyme adenosine kinase (ADK) appear to favor prolonged febrile seizures and subsequent epileptogenesis. This grant aims to identify high expression of ADK as a risk factor for febrile seizures and subsequent epileptogenesis, and to define ADK as a target for therapeutic intervention aimed at the prevention of epileptogenesis.

Investigator: Anne Williamson, Ph.D.
Title: Associate Professor
Institution: Yale University
Project Title: Neuronal-Glial metabolism in epileptogenic cortical malformations in Patients

Summary: Certain brain malformations can cause medically intractable seizures in children. The goal of this work is to use resected tissue from epileptic patients to obtain a metabolic signature for different types of malformations using a combination of neurochemical and imaging techniques. These studies will allow us to better understand how different classes of cells interact biochemically in different types of epileptogenic tissue. This work will help explain why certain types of malformations produce seizures as well as to identify new targets for therapy.