

**Department of Pediatrics
COLLEGE OF MEDICINE**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 2, 2015

The Department of Pediatrics is pleased to offer the following research project for the summer of 2015. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

Project Title: Translational regulation of the Kv4.2 complex in epilepsy and Fragile X syndrome

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Project Description

Many neurological diseases are characterized by an imbalance of neuronal activity, leading to disturbed brain function and, in some cases, epileptic seizures. Examples of neurological diseases with deficiencies in the regulation of neuronal excitability are epilepsy, autism spectrum disorders, and schizophrenia.

To understand mechanisms that can lead to hyperactivity of brain neurons in these diseases, our lab is studying an important 'gate keeper' of neuronal excitability in the brain, the potassium channel Kv4.2. Kv4.2 is essential to control activity of neurons in the brain. For example, mutations in Kv4.2 can lead to epilepsy or autism. Our lab has shown that Kv4.2 is altered in the inherited intellectual disability and autism spectrum disorder Fragile X syndrome. We are now interested in revealing the molecular mechanisms of how the protein expression of Kv4.2 is regulated in neurons.

My lab uses *in vivo* mouse models and cellular models of Fragile X syndrome and epilepsy, and a variety of molecular, cellular and biochemical methods. Depending on the student's interests, she will be involved in immunohistological methods to detect proteins and mRNAs in brain tissue, western blotting and/or RNA-protein binding analyses. The prospective student's project will be part of a larger collaborative study to understand the mechanisms that control Kv4.2 expression and function in the brain with the overall goal to use Kv4.2 as therapeutic target for Fragile X syndrome or epilepsy in the future.