

**Department of Neurology
COLLEGE OF Medicine**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 2, 2009

The Department of Neurology is pleased to offer the following research project for the summer of 2009. 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.

The immune response to Intracerebral hemorrhage

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Project Description

Our lab is investigating the various mechanisms that lead to brain injury after intracerebral hemorrhage (ICH). ICH is a type of stroke caused by bleeding into the brain. Aside from the presence of the blood itself compressing the brain, there are additional factors that contribute to brain injury. One of those is inflammation. Inflammation in the brain is an interesting topic because the brain can be thought of as an immune-specialized organ, in that the immune system does not normally gain access to the brain. We are interested in studying inflammation after ICH. In particular, we are looking for factors that may alter the level of inflammation. These factors are molecules generated from the breakdown of hemoglobin and they are bilirubin and bilirubin oxidation products (BOXes). Some questions include whether bilirubin and BOXes exacerbate inflammation and brain damage after ICH. Can this be altered by inhibiting hemoglobin breakdown?

The student will be working on an *in vitro* project related to this topic. Although she will receive supervision and guidance, the goal of the project will be to allow the student to have some intellectual independence in the design of the project. Two possible projects include examining the effects of bilirubin and BOXes on peripheral immune cells or using cultures of astrocytes and/or microglia (immune cells endogenous to the brain) to test the effects of these molecules.