

DIVISION OF PHARMACEUTICAL SCIENCES  
JAMES L. WINKLE COLLEGE OF PHARMACY

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: 03/01/2020

PROJECT TITLE: 5-HT<sub>2A</sub> Receptor Modulation Following Traumatic Brain Injury

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**Project Description**

Traumatic Brain Injury (TBI) leads to nearly 3 million emergency department visits annually in the United State alone. The generation of neuropsychiatric disorders following TBI is common and the molecular mechanisms driving these effects are currently not well understood. Utilizing a preclinical model for TBI, we have discovered alterations in specific aspects of serotonin (5-HT) signaling following injury that are correlated to changes in behavior. We hypothesize that these changes are driving changes in behavior that are associated with disrupted social function and/or the generation of depression. The current WISE project therefore focuses on whether pharmacologically targeting 5-HT<sub>2A</sub> receptors reverses TBI-induced deficits in social behavior and/or increased despair-like behavior. The WISE student will be tasked with conducting experiments, utilizing a murine model of blast-induced TBI, to study the role of 5-HT<sub>2A</sub> receptors in the behavioral and biochemical ramifications of neural injury. The WISE student will learn various assays relevant to the study of rodent behavior and will be exposed to a wide breadth of standard molecular biology techniques such as real-time quantitative PCR, western blotting and ELISA assays. Additionally, the student will receive training in the areas of data analysis and the presentation of scientific data. All research will be conducted under the approved IACUC protocol #18-01-17-01.