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Faculty Mentor's Department: Biological Sciences

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Project Title: Identification of Robust Biomarkers for Posttraumatic Stress Disorder Using Longitudinal Analysis

Project Description: Posttraumatic stress disorder (PTSD) is the fifth most common psychiatric disorder, with an occurrence rate of approximately 8% in the United States. Left untreated, PTSD can be life-threatening, as it is often linked to substance abuse and severe depression. Thus, there is a pressing need to identify reliable molecular and physiological biomarkers of PTSD for the accurate diagnosis, prognosis, and treatment of the disorder. The Department of Defense-funded Systems Biology of PTSD Consortium has collected blood samples and demographic/clinical data from over 200 male combat veterans with and without PTSD for the purposes of identifying these biomarkers. Recently, a subset of these veterans has been reassessed at an additional time point 3 years after the initial assay. The goal of this project is to use data from both the original and follow-up time points—*longitudinal* data—to identify more robust biomarkers for PTSD. Specifically, by redefining candidate biomarkers in terms of their differences between two time points, patient-specific, PTSD-nonspecific variability can effectively be subtracted away. Statistical and machine learning tools will be applied to clinical and molecular longitudinal data to identify robust biomarkers for PTSD. Knowledge of these markers will contribute to an improved understanding of the biological mechanisms underlying PTSD pathophysiology.

Requirements for Student Applicants: Through the U.S. Army Research Office Undergraduate Research Apprenticeship Program (URAP), the Daigle Lab has funding for one student researcher to work on the above project in summer 2019. Candidates should currently be enrolled in their second or third year at the University of Memphis in a degree program within the Departments of Biological Sciences, Computer Science, or Biomedical Engineering. Desired qualifications include GPA >3.5 and some prior computer programming experience. Applicants must provide a current CV, at least one letter of recommendation, and a one page personal statement describing academic preparation, prior research experience, and future career goals. Applications must be submitted online **by February 28, 2019** through the following webpage:

https://www.usaeop.com/program/urap/

Starting Date and Duration: The position will begin on a mutually agreed upon date in June 2019 and continue for up to 10 weeks.

Method of Compensation: The selected student will receive $15/hour for up to 300 total hours of summer research.