**SUMMER 2024 – SC INBRE RET PROJECT DESCRIPTION FORM**

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| **Mentor's Name** | Erin Wamsley |
| **Institution** | Furman University |
| **Center** | Department of Psychology and Program in Neuroscience |
| Mailing Address | 3300 Poinsett Highway, Johns Hall 206K, Greenville SC 29609 |
| **Telephone** | 864-294-3218 |
| **Email** | erin.wamsley@furman.edu |
| **Research Subject Area** | Memory consolidation during sleep and other states of rest |

**A. Briefly describe overall research program at your laboratory:**

Psychology and Neuroscience have traditionally studied the human mind and brain by measuring an organism's response to external stimuli. Yet humans spend surprisingly little time in this "on task" mode, actively processing information in the immediate environment. We spend nearly a third of our lives sleeping, and even during wakefulness, approximately half of our time is spent mind wandering -- thinking, reminiscing, daydreaming or imagining something other than what we are currently doing. Research in the *Furman Sleep Laboratory* concerns the function of these offline states of sleep and rest. It is becoming increasingly clear that the so-called "resting" brain is actually hard at work processing recent experience, integrating new memories into existing neural networks, and preparing us for the future.

In the summer of 2024, we will be running several projects that focus on how memory is processed in the brain during periods of sleep and/or rest after learning. To address this research question, we use EEG (electroencephalography, i.e. "brainwave" recording), pupillometry (measurement of changes in pupil diameter), and behavioral testing in human participants.

**B. Briefly describe specific project(s) for your teacher:**

This summer we will be conducting NSF-funded projects about how very short, seconds-long periods of rest during wakefulness allow the reactivation and strengthening of just-formed memories. We propose that this process underlies the early stages of memory consolidation and is required for subsequent phases of sleep-dependent consolidation to occur. The teacher would contribute to this work and also have the opportunity to work on additional projects which may address the brain basis of dreaming and the consolidation of memory in persons diagnoses with ADHD. All of these research projects offer ample opportunity for a teacher to develop activities that would engage their high school students in the lab and classroom. The teacher would have the opportunity to learn how to record and analyze EEG.

**C. Will any other people (post docs, grad students, undergraduate students, colleagues, etc.) be involved directly with your teacher?**

Besides the PI, there will be 4 undergraduate students and 1 full-time staff research assistant working the lab this summer. The teacher would join our group as a member of this team, which works collaboratively on several projects across the course of the summer.

**D. Will you require any advanced reading/preparation for the teacher?**

No, all necessary training and background would be provided as a part of the research experience, beginning at the start of the summer.