DANIELLE BOND & KRISTEN WINTER, Dept of Biology, Fairmont State University, Fairmont, WV 26554. Influence of Lights Wavelength and Exposure Timing on Cognitive Function in Zebrafish.

The development of advanced technologies and widespread use of electronic devices has drastically increased human exposure to artificial light, leading to questions about what effects different wavelengths have on cognitive function. Blue light, which decreases melatonin production and increases alertness, is emitted from natural sunlight as well as from everyday electronic screens such as computers, televisions, and cell phones. In contrast, red light has been shown to have weaker effects on circadian rhythm disruption and melatonin suppression. This study examines how the timing of blue- and red-light exposure affects the learning and memory retention of zebrafish using behavioral learning trials. Previous research suggests that morning exposure to blue light may stimulate brain regions associated with learning and memory, whereas exposure in the late evening can disrupt circadian rhythm and melatonin production. Red light exposure, however, has been shown to minimize the suppression of melatonin production and may help with cognitive recovery. By comparing learning rate and memory retention in zebrafish exposed to different wavelengths of artificial light during either morning or evening hours, this study aims to determine whether the timing and wavelength of light influence cognitive function. The findings from this study will provide insight into how the timing and wavelength of artificial light exposure may influence cognitive performance and circadian regulation. This research was made possible by WV Higher Education Policy Commission, STaR Division.