In today's day and age, constant use of digital devices has made blue light exposure unavoidable, as these technologies are essential for daily tasks. This exposure leads to oxidative stress through excessive reactive oxygen species (ROS), contributing to cellular damage in retinal tissue. Current approaches largely focus on reducing blue light exposure rather than addressing the underlying causes of oxidative stress. Excessive ROS levels are harmful as they can disrupt mitochondrial function in retinal cells, eventually leading to cell death. Our project aims to detect oxidative stress and mitigate the excess levels that are produced in response to blue light exposure. The first plasmid functions as a sensor, detecting elevated ROS levels and producing a visible GFP (green fluorescent protein) signal as an indicator of oxidative stress, while the second plasmid acts as a responder by expressing superoxide dismutase 2 (SOD2), an antioxidant enzyme that neutralizes excess ROS. This approach allows the cell to maintain normal function while reducing the harmful effects of excess ROS. The two plasmids are assembled and validated in *E. coli*, an efficient microbial chassis, and are subsequently introduced into *C. elegans* through feeding to enable organism-level oxidative stress reporting. This blue light–regulated oxidative stress sensing system links an external stimulus to a genetic response, enabling precise monitoring of cellular health and scalable biosensor applications. This innovation allows for precise monitoring of cellular health and opens the gates to biosensors that can be expanded for medicine, research, and even education.