Bioluminescent bacteria *V. fischeri* mutants ANS10 and ZF42 for catalase and *AhpC* and their exposure to oxidative stress

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Vibrio fischeri is a free-living motile bacterium that lives in a marine environment and colonizes the light organ of the Hawaiian bobtail squid *Euprymna scolopes* to create a symbiotic relationship. *V. fischeri* benefits its host by emitting bioluminescent light nocturnally, which helps *E. scolopes* to camouflage from predators. In the squid's light organ, the bacteria undergo oxidative stress that is produced in response to the colonization. Previous experiments show that these bacteria have developed a characteristic against oxidative stress, which allows them to survive and thrive. In response, the antioxidant enzymes catalase (*katA*) and peroxidase (*AhpC*) degrade the reactive oxygen species (ROS) of hydrogen peroxide created. We hypothesize that the mutant strains ANS10 and ZF42 mutated for the antioxidant enzymes will have difficulty growing in an environment with ROS such as hydrogen peroxide. To test this hypothesis, we will use the bacterial strains to compare their growth with and without hydrogen peroxide. The optical density was measured to create a growth curve from the data. Results showed that the bacterial strains diminished growth and died after the addition of the peroxide. It was concluded that oxidative stress affects bacteria devoid of these enzymes, and that *katA* and *AhpC* play key roles in hydrogen peroxide degradation.