

Undergraduate Category

Poster Title:

Isolation of Bioluminescent luxY gene from *Aliivibrio fischeri*

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Abstract

The bioluminescence seen in *Aliivibrio fischeri* comes from the reactions between the yellow fluorescent protein and the enzyme luciferase, and while there are also many other factors that control this bioluminescence, this project focuses on the luxY gene, which is one of the genes that codes for the yellow fluorescent protein (Miyashiro and Ruby 2012; Baldwin et al. 1990). *Vibrio fischeri* is a gram-negative bacterium that is found in salt and freshwater habitats (Nealson et al. 1970; Verma and Miyashiro 2013). This bacterium is able to make use of chemical signals called "quorum sensing," which allows *Vibrio fischeri* to control their community's behavior by controlling the population number, based on the resources available to the bacteria (Miyashiro and Ruby 2012; Schuster et al. 2013; Verma and Miyashiro 2013). *Vibrio fischeri* is able to control the behavior, such as emitting bioluminescence, of such a large colony by using signaling molecules to release a chemical signal that modifies the expression of a certain gene, which can inhibit or enhance the specific behavior (Verma and Miyashiro 2013). Quorum sensing and the bioluminescence seen in *Vibrio fischeri* have been especially interesting to scientists because these phenomena have influenced the symbiotic relationship between *Vibrio fischeri* and the Hawaiian Bobtail Squid (*Euprymna scolopes*) (Haddock et al., 2010; Rader and Nyhom 2012).