

You Light Up My Life!

It is often misconstrued that communication can only be done by macro-organisms including the common man. This is the central dogma that is circulated universally. Organisms like *Alivibrio fischeri*, or what was once known as *Vibrio fischeri* has challenged this theory. Microorganisms are able to communicate through a mechanism called quorum sensing. Quorum sensing is a system of stimuli and response correlated to population density. Quorum sensing allows bacteria to restrict the expression of specific genes to the high cell densities at which the resulting phenotypes will be most beneficial. They coordinate gene expression according to the density of their local population. This is exactly how *A. fischeri* showcases its light producing abilities.

The regulation of the gene expression of *A. fischeri* changes in response to cell density. Quorum sensing bacteria produce and release autoinducers. Autoinducers modify gene expression after a sudden change in cell population density. Quorum sensing bacteria relies upon the synthesis of a signal molecule. *Alivibrio fischeri* is found naturally in high densities in the light producing organs of *Euprymna scolopes*, which is a small Hawaiian squid. They have a symbiotic relationship where the microbes erase the shadow that would normally be seen as the moon's rays strike the squid, protecting the squid from its predators. The squid in turn, provides the bacteria with shelter and a stable source of nutrients.

Suruthimitra Okpoluaefe A/P Okpoluaefe Godspower Udezi, Kavasha A/P Parameswaran, Hanif Baharin, Siti Sarah Othman and Wan Zuhainis Saad





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