
Is *Photobacterium phosphoreum* ANT2200 Bioluminescence under Quorum sensing control?

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Abstract

Bacterial bioluminescence has mainly been studied in *Vibrio* species and its study has led to the discovery of quorum sensing. Indeed, in these strains, the production of light occurs when the cell density reaches a certain threshold. Since then, bioluminescence has generally been considered as the reference mechanism for this phenomenon in these microorganisms. *Photobacterium phosphoreum* ANT-2200, a bioluminescent bacteria, has been isolated, by our group, from the NW Mediterranean Sea at 2200-m depth close to the ANTARES neutrino telescope. Its genome has been sequenced recently. In our lab, we have been interested in studying the bioluminescence in this *Photobacterium* strain through physiological and molecular approaches. The genetic organization of the *lux* operon in *Photobacterium* strains is completely different from the one in *Vibrio* species. Indeed, it lacks the genes *luxI* and *luxR*, the quorum sensing signature. Moreover, in *Photobacterium*, the operon coding for bioluminescence is longer and includes 4 more genes potentially coding for riboflavine synthesis, a luciferin precursor. Although bioluminescence control in *Vibrio* species has been thoroughly studied, almost nothing is known about the *Photobacterium* counterpart. Our aim is to correlate the gene expression, the bioluminescence production and the growth in *P. phosphoreum* ANT-2200 comparing various conditions of incubation such as *in situ* pressure and atmospheric pressure conditions.

Keywords: bacterial bioluminescence, *Photobacterium*, quorum sensing

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