The bacteria bioluminescence as a protection from oxidative stress

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The defense mechanisms of bacterial luminescence against oxidative stress is proposed. Some species of luminescent bacteria were examined for superoxide anion (O$_2^-$) production and superoxide dismutase and catalase activities. The extracellular generation of O$_2^-$ were discovered through the logarithmic phase of bacterial growth. Luciferase activity increase with increasing the light intensity. The specific activities of superoxide dismutase and catalase were increased as the adaptive response of bacteria under oxidative stress. The Fe$^{2+}$-ions induced the bioluminescence. The dark mutants lost the resistance to oxidative stress. In spite of the mechanism of the O$_2$ production is unknown, this phenomenon may be important for hosts colonization.
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