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Quorum sensing in *Pseudomonas aeroginosa*

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P. aeruginosa is most well-known as a biofilm-forming bacterium. It is an opportunistic pathogen and majority of the infections are commonly associated with nosocomial infection and infection in immunocompromised hosts. Infections with *P. aeruginosa* are difficult to eradicate, due to their high levels of antibiotic resistance and growth in biofilms. Production of secondary metabolites is controlled by a cell-cell signaling system that is generally described as quorum sensing (QS) or density-dependent gene regulation. QS, bacterial cells send a small diffused signal molecule called autoinducer (AI) to the next bacterial cells for the biofilm formation, and the bacteria contact each other for stimulation and interaction with other bacteria. For this reason, extracellular signals and QS regulation system is very important for presence of biofilm, and it has been considered an attractive target for the development of new treatment strategies. QS regulation in the *P. aeruginosa* is controlled by at least two pairs of gene *[LasI (LasI/lasR) - RhII (RhlI/RhlR)]*, coded N-acylated homoserine lactones. *LasI and RhII* genes are stimulate the signal molecules. While *LasI* codes N-(3-oxododecanoyl) homoserine lactone (3O-C12-HSL) which is a AI sentase, *RhII* codes the N-butyryl homoserine lactone (C4-HSL). As there is a rise of the bacterial population, these signal molecules are produced and saved by *P. aeruginosa* and transcriptional regulators come from the same origin for activation and binding of these molecules, intracellular concentration triple as soon as short time. *LasI and RhI* systems regulate the virulence factors such as elastase, alkaline phosphatase, hydrogen cyanide, exotoxin A, secretor proteins, catalase, rhamnolipid, pyosiyanine, lectins, acylated homoserin lactones (AHLs) and superoxide dismutase production. The third gen couple which helped in regulating QS is PQS-MvfR. The expression of PQS depends on LasR, and Rh1R gene increases in the expression. In conclusion obtained from findings, QS mechanism will make contributions to keep the lights in medical area via improvements of treatment against the antibiotic-resistant *P. aeruginosa* and struggles with it in food processing plant bacterial cells for the biofilm formation, and the bacteria contact each other for stimulation and interaction with the other bacteria for this reason.

Biography

Belgin Sırıken is an expert in Food Microbiology, Safety and Chemical Properties of Particularly Animal Origin Foods. She has completed her PhD at Ankara University, and now she is working as Prof. Dr. at Ondokuz Mayis University, Samsun, Turkey. Her focus is on Molecular Food Microbiology.

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