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Competence regulators in Gram-positive bacteria

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Genetic competence is a specific physiological state developed to undergo natural transformation. The machinery for DNA-uptake is similar among bacteria but the competence regulatory circuits are species-specific. Among Gram-positive bacteria, there are two different and evolutionary distinct central competence regulators, the alternative sigma factor ComX (also known as σ^H) and the transcription factor ComK. Some species, like *Bacillus subtilis*, *Staphylococcus aureus* and *Listeria monocytogenes*, have both regulators. However, only in *B. subtilis* their function has been clearly and extensively studied. In *B. subtilis*, these regulators form a regulatory network in which ComK is the main regulator of competence achievement and σ^H controls sporulation development. In non-spore forming species (*Streptococcus pneumoniae* and *Staphylococcus aureus*), the main competence regulator is ComX/ σ^H and it has been reported that ComK can enhance the σ^H directed transcription of *comG* and *comE* operons in *S. aureus*. *Listeria monocytogenes* is a non-spore forming bacteria without any reports of competence development, but the competence machinery genes (controlled by ComK) have been reported to be important for optimal phagosomal escape. Here, we review the current knowledge regarding competence regulation among Gram positive bacteria.

Biography

Veronica Medrano Romero graduated from Biology in Mayor de San Andres University in La Paz, Bolivia. She got her Master degree in Medical Sciences in the University of Tsukuba, Japan in 2011. Currently, she is a second year student of the Doctoral Program in Biomedical Sciences in the same university.

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