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Genetic mechanisms of bacilli adaptation

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Abstract

Adaptive strategies of bacilli involving genetic regulatory mechanisms are reviewed. The role of master regulators and signal transduction systems that coordinate the interaction of the extracellular signals and the genetic programs responsible for the metabolic state of bacteria are discussed. Most of the known regulatory pathways are directly or indirectly regulated by the DegU, Spo0A, AbrB, and CodY global regulators. The main factor affecting the development of cell phenotype is the concentration of the regulatory protein and its ability to bind with varying affinity to promoters of the genes and operons. The effect of the regulatory systems on the bistability of microbial populations is discussed. © 2013 Pleiades Publishing, Ltd.

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Keywords

Bacillus subtilis, competence, master regulator, population bistability, signal transduction, sporulation, two-component systems