

Specificity and time of the appearance of his⁺ reversions induced by histidine starvation in salmonella typhimurium

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Abstract

It was previously established that reversion of the hisG46 allele of *Salmonella typhimurium* to prototrophy occurred upon histidine starvation. In this paper, it was shown that histidine starvation does not affect the appearance of mutants resistant to L-arabinose and rifampicin. Threonine starvation did not change the frequency of His⁺ revertants. Analysis of His⁺ revertant clones did not reveal additional L-arabinose resistance mutations. Thus, these experiments allowed the conclusion that amino acid starvation does not lead to a nonspecific increase in the mutation rate. In addition, it was shown that spontaneous His⁺ revertants start to arise after two to three hours of histidine starvation, this process lasting for four days. Nevertheless, original His⁺ cells did not grow in a culture generating His⁺ revertants. Traces of histidine and novobiocin added to a minimal medium retarded reversion realization. However, the occurrence of revertants was not markedly inhibited by chloramphenicol. Based on the results, it is assumed that adaptive His⁺ reversions occurred due to a special mode of replication induced upon histidine starvation and requiring no de novo protein synthesis.
