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Induction of the SOS-response in test bacteria by bacillus intermedius RNase

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Abstract

This paper deals with the induction of the SOS-functions of a bacterial cell by the exogenous ribonuclease of *Bacillus intermedius*. Two test systems were employed, which made it possible to quantitatively estimate SOS-response induction activity in gram-positive and gram-negative bacteria. It was established that the catalytically active enzyme elicits the SOS-response in the cells of *Escherichia coli* PQ 37 and causes prophage induction in the lysogenic strain *Bacillus subtilis* 168 cp10S WT (a phenomenon related to the SOS-response). An enzyme with a His101Glu-substituted active center, exhibiting residual catalytic activity, failed to induce the SOS-response in an SOS-chromotest with *E. coli* PQ 37, indicating dependence of the SOS-inducing effect of the enzyme on its catalytic activity. It is suggested that the effect of active ribonuclease on membrane-bound and cytoplasmic RNA causes a change in the nucleotide pool and, as a consequence, elicits the SOS-response of the cell.

Keywords

Bacillus intermedius, Microbial test systems, Ribonuclease, SOS-response