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Study of the mechanism of action of p-chloromercuribenzoate on endonuclease from the bacterium *Serratia marcescens*

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Abstract

The mechanism of action of p-chloromercuribenzoate (PCMB) on *Serratia marcescens* nuclease was investigated. The analysis showed that PCMB forms complexes with DNA. Binding of $C_7H_5O_2Hg^+$ to DNA changes the secondary structure of the DNA. These changes alter the enzymatic activity of *S. marcescens* nuclease, which was previously found to be sensitive to the secondary structure of the substrates. The nuclease activity was either suppressed or stimulated in the presence of PCMB depending on the $C_7H_5O_2Hg^+$ to nucleotide equivalent ratio. Binding of $C_7H_5O_2Hg^+$ to DNA did not form an abortive enzyme-substrate complex. Binding of Mg^{2+} to the $C_7H_5O_2Hg$ -DNA complex caused appropriate changes in secondary structure of the substrate. Since Mg^{2+} and $C_7H_5O_2Hg^+$, though differing in the type of metal cation, are similar in their mechanisms of influence on enzymatic activity of *S. marcescens* nuclease, the identity of other metal-containing effectors in their mechanism of action on *Serratia marcescens* nuclease is assumed.

Keywords

CD, DNA, Endonuclease, PCMB, *Serratia marcescens*