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The effects of carboxypeptidase *Taq* activity by metal ions and active center metal

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The expression conditions to produce a high amount of carboxypeptidase (CPase) *Taq* in *Escherichia coli* cells were examined. *E. coli* cells harboring CPase Taq expression plasmid produced a high amount of the enzyme when they were cultured in the absence of IPTG, although this plasmid is directed by the *tac* promoter which requires IPTG induction for it's promoter activity. Because the enzyme is proteolytic enzyme, the induced expression of CPase *Taq* gene in *E. coli* cells by IPTG may disturb cell growth. We also analyzed improvement on the enzyme activity of CPase *Taq* by addition of various metal ions. The enzyme activity was increased more then four times by 1 mM cobalt ion and almost three times in by 1 mM calcium ion. However, the active center metal zinc ion did not affect the enzyme activity. In order to investigate whether the active center metal affects the enzyme activity, zinc ion which is occupied the active center of the enzyme was replaced by cobalt ion which activates the enzyme activity very effectively. Since the cobalt ion in the active center of the cobalt-substituted CPase *Taq* did not affect the enzyme activity, it could act as the native metal ion in the active center of the enzyme.