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Starvation-Mediated Acid and Base Resistance in *Escherichia coli*

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Escherichia coli K12 strain and its some mutant such as *katF*, *pta*, *ackA* and *ackApta* strains are challenged to acidic pH and alkaline pH after grown to stationary phase for 17 hours. Wild type K12 showed higher viability than *katF* at pH 3.5. pta and ackApta strains survived poorly but showed higher viability than *katF* mutant. But *ackA* mutant exhibited nearly same viability as wild type for 2hours at pH 3.5. This results showed certain component in the acetate activation pathway may has a role in the growth arrest and the acidic condition. At pH 9.0, they exhibited difference a little. To investigate what regulators are activated in the cell in response to growth arrest and in the acidic condition, *ackA* multicopy plasmid was transformed into *katF::lacZ* mutant. And β-galactosidase assay was performed.

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Purification and properties of D-(-)-β-hydroxybutyrate dehydrogenase from *Alcaligenes eutrophus* H16.

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D-(-)-β-hydroxybutyrate dehydrogenase (EC 1.1.1.30) which is participated in poly-β-hydroxybutyrate degradation pathway was purified from *Alcaligenes eutrophus* H16 to electrophoretic homogeneity. The molecular weight of the enzyme determined by polyacrylamide gel electrophoresis in the presence of sodium dodecylsulfate was 29,000. The enzyme showed a pH optimum at 8.0 in the oxidation reaction. The km values for D-(-)-β-hydroxybutyrate and NAD in the oxidation reaction were 1×10^{-3} M and 1.5×10^{-4} M, respectively. The km values for acetoacetate in the reduction reaction was 4×10^{-4} M and that for NADH was 3.8×10^{-5} M. Divalent cations such as Mg^{2+} and Mn^{2+} were effective stimulator for the oxidation of D-(-)-β-hydroxybutyrate, whereas there was no inhibitory effect by PMSF and dithiothreitol. N-terminal amino acid sequence showed that the enzyme is one of the short chain alcohol dehydrogenase family.