Lactaldehyde dehydrogenase (EC 1.2.1.22), *Escherichia coli*

Catalogue number:

AE00031, 4.0 mg

Description

Lactaldehyde dehydrogenase (E.C. 1.2.1.22) from *E. coli* (*aldA* gene product, P25553) is a homotetrameric protein, localized in the cytoplasm, which unliganded 3D structure bas been deposited in the RCSB Protein Data Bank with accession code 2hg2 (Constanzo *et al*., 2007). Each monomer is composed of a catalytic domain, a cofactor NAD^+ binding domain and an oligomerization domain. This enzyme, with systematic name L-lactaldehyde:NAD^+ oxidoreductase, belongs to the superfamily of NAD^+- or $NADP^+$-dependent enzymes that catalyze the oxidation of aldehydes to the corresponding carboxylic acids. These enzymes are widespread in all living systems, from archea to eukaryotes, where they metabolize endogenous and exogenous aldehydes. This lactaldehyde dehydrogenase from *E. coli* is an NAD^+-dependent enzyme implicated in the metabolism of L-fucose and L-rhamnose (Baldoma and Aguillar, 1987). L-lactaldehyde is generated as an intermediate in the metabolism of L-fucose and L-rhamnose in bacteria that utilize these carbohydrates as a carbon source. However, the enzyme may function in multiple metabolic pathways due to its ability to catalyse the oxidation of several aldehydes, with a K_m in the micromolar range for α-hydroxyaldehydes (lactaldehyde, glyceraldehydes or glycoaldehyde), and a higher K_m, in the millimolar range, for the α- ketoaldehyde methylglyoxal. The enzyme is provided in 3.2 M ammonium sulphate.

Purity

Lactaldehyde dehydrogenase has been determined to be >95% pure, according to SDS polyacrylamide gel electrophoresis (PAGE) followed by Coomassie Blue staining (Figure 1).

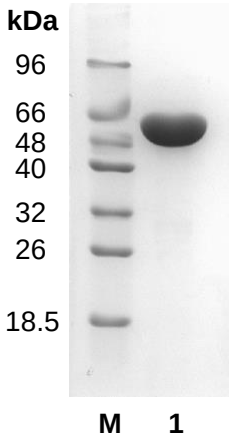

Figure 1. SDS-PAGE analysis of *E. coli* lactaldehyde dehydrogenase. Electrophoresis was performed using a 10% polyacrylamide gel. Lane M, molecular weight marker; Lane 1, purified lactaldehyde dehydrogenase from *E. coli* K12.

Storage temperature

Lactaldehyde dehydrogenase should be stored at 2 °C to 8 °C.

Temperature and pH optimum

The optimum pH and temperature are 9.5 and 25 °C, respectively.

Catalytic activity

The reaction mixture should contain 100 mM sodium glycine buffer, pH 9.5, 0.125 mM NAD^+ and 1 mM lactaldehyde. NADH formation is determined by measuring the increase in absorbance at 340 nm.

References

Constanzo *et al*. (2007) Journal of Molecular Biology 366, 481-493.

Baldoma and Aguillar (1987) The Journal of Biological Chemistry 262, 13991-13996.

V2202

Certificate of Analysis

Test	Criteria	Result
Protein purity	Purity in line with the stated value	Meets specification
Protein concentration	Concentration in line with the stated value	Meets specification
Blank assay variability	Absorbance values with less than 10% of variability	Meets specification

Approved by:

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