D-Lactate dehydrogenase (EC 1.1.1.28), *Leuconostoc mesenteroides*

Catalogue number:

AE00121, 22 kU (25 mg)

Description

Recombinant D-lactate dehydrogenase (EC 1.1.1.28) is purified from a modified *E. coli* strain. D-Lactate dehydrogenase is an enzyme that catalyzes specifically the reduction of D(+) lactate to pyruvate with concomitant oxidation of NAD^+ to NADH. This enzyme belongs to the family of oxidoreductases, specifically those acting on the CH-OH group of donor with NAD^+ or $NADP^+$ as acceptor. The systematic name of this enzyme is D-lactate:NAD^+ oxidoreductase. This enzyme has been identified mainly in lower organisms and, e.g. in lactic acid bacteria, where it plays a key role in anaerobic energy metabolism. In fact, very few D-specific enzymes have been identified in vertebrates. In rare instances, accumulation of D-lactate has been reported in patients with short-bowel syndrome leading to severe lactic acidosis. The quality of several food products are correlated to its content of D-lactic acid. The enzyme is provided in 3.2 M ammonium sulphate and should be stored at 4 °C. Swirl to mix the enzyme suspension immediately prior to use.

Purity

D-Lactate dehydrogenase has been determined to be >95% pure, according to sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) followed by Coomassie Blue staining (Figure 1).

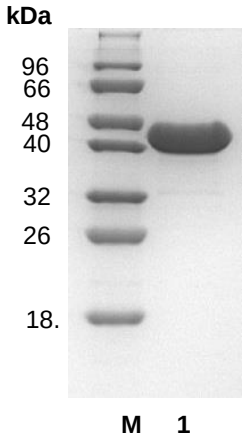

Figure 1. SDS-PAGE analysis of *L. mesenteroides* D-lactate dehydrogenase. Electrophoresis was performed using a 14% polyacrylamide gel. Lane M, molecular weight marker; Lane 1, purified D-lactate Dehydrogenase (42 kDa).

Storage temperature

D-Lactate dehydrogenase should be stored at 2°C to 8°C.

Temperature and pH optimum

The optimum pH and temperature are 7.0 and 37 °C, respectively.

Specific activity

890 U/mg protein; 8900 U/ml.

Unit definition

One unit is defined as the amount of enzyme required to produce 1 µmol of NAD^+ from NADH in a reaction mixture containing 92 mM sodium phosphate buffer, pH 7.0, 0.77 mM pyruvic acid and 0.2 mM NADH, at 25 °C.

Substrate specificity

Under the reaction conditions specified the enzyme does not present any other detectable catalytic activity.

References

Flick MJ, Konieczny SF (2002) Identification of putative mammalian D-lactate dehydrogenase enzymes. Biochem Biophys Res Commun, 295, 910-916.

Taguchi H, Ohta T (1991) D-Lactate dehydrogenase is a member of the D-isomer-specific 2-hydroxyacid dehydrogenase family - Cloning, sequencing, and expression in *Escherichia coli* of the D-lactate dehydrogenase gene of *Lactobacillus plantarum*. J. Biol. Chem. 266, 12588–12594.

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
Catalytic activity	Activity 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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