AE0002_UG_EN_V2302

Aldehyde reductase YqhD, *Escherichia coli*

Catalogue number	Presentation
AE00021	2.0 mg (1 mL)

Description

YqhD from *E. coli* is a homodimeric protein, localized in the cytoplasm, which coordinates of the 3D structure have been deposited in the RCSB Protein Data Bank as entry 1Oj7 (Sulzenbacher *et al.*, 2004). Each monomer has a two-domain structure, one domain that binds the cofactor NADPH and the other the catalytic metal Zn^{2+}. This enzyme belongs to the aldo-keto reductase superfamily, a group of enzymes responsible for a wide array of biological functions. Pérez *et al.* (2008) showed that YqhD is an aldehyde reductase involved in the cellular resistance to Reactive Oxygen Species (ROS)-generating compounds and "reactive aldehydes". YqhD catalyses the NADPH-dependent reduction of various membrane peroxidation derived aldehydes, including acetaldehyde, propanaldehyde, butanaldehyde, acrolein and malondialdehyde (MDA). It was suggested that YqhD is part of a specific defense mechanism against reactive aldehydes generated by membrane peroxidation in *E. coli* (Pérez *et al.*, 2008). The enzyme is provided in 3.2 M ammonium sulphate.

Purity

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

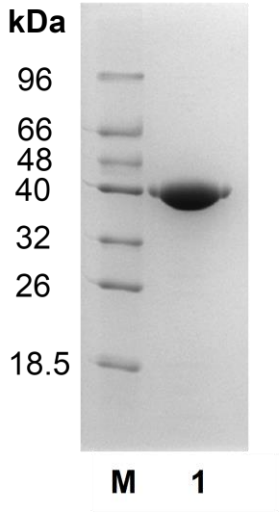

Figure 1. SDS-PAGE analysis of E. coli aldehyde reductase YqhD. Electrophoresis was performed using a 10% polyacrylamide gel. Lane M, molecular weight marker; Lane 1, purified YqhD from *E. coli* K12..

Storage temperature

Aldehyde reductase YqhD should be stored at 2 °C to 8 °C.

Temperature and pH optimum

The optimum pH and temperature are 7.0 and 25 °C, respectively.

Activity

The reaction mixture should contain 50 mM potassium phosphate buffer, pH 7.0, 2 mM NADPH, a specific aldehyde and purified YqhD (10 µg/ml). NADPH oxidation is determined by measuring the reduction in absorbance at 340 nm. The enzyme does not present $NADP^+$-dependent dehydrogenase activity on methanol, ethanol, propanol, butanol or isopropanol.

References

Pérez *et al*. (2008) The Journal of Biological Chemistry 283, 7346-7353.

Sulzenbacher *et al*. (2004) Journal of Molecular Biology 342, 489-502.