Active Aldehyde Dehydrogenase 1 Family, Member A1 (ALDH1A1)

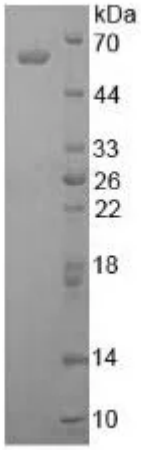
Catalog#:PEH12939

概述（Summary）

别称（Alternative Names）	ALDH11; ALDH1; ALDC; PUMB1; RALDH1; Retinaldehyde Dehydrogenase 1; Aldehyde dehydrogenase, cytosolic; Retinal dehydrogenase 1
纯度（Purity）	Greater than 95% as determined by reducing SDS-PAGE.
内毒素（Endotoxin level）	Please contact with the lab for this information
蛋白构建（Construction）	【Ser2-Ser501】
Accession #	P00352
表达宿主（Host）	E.coli
种属（Species）	Homo sapiens (Human)
预测分子量（Predicted MW）	58.4 kDa
制剂（Form）	Lyophilized from a 0.2 μm filtered solution of PBS, pH7.4, containing 0.01% SKL, 1mM DTT, 5% Trehalose and Proclin300.
运输方式（Shipping）	The product is shipped with ice bag. Upon receipt, store it immediately at the temperature listed below.
稳定性&储存（Stability &Storage）	12 months at -20°C to -80°C in lyophilized state.6 months at -20°C to -80°C under sterile conditions after reconstitution.7-10 days at 2°C to 8°C under sterile conditions after reconstitution.Please minimize freeze-thaw cycles.
复溶（Reconstitution）	Reconstitute in 10mM PBS (pH7.4) to a concentration of 0.1-1.0 mg/mL. Do not vortex.
背景介绍（References）	Cytosolic dehydrogenase that catalyzes the irreversible oxidation of a wide range of aldehydes to their corresponding carboxylic acid. Functions downstream of retinol dehydrogenases and catalyzes the oxidation of retinaldehyde into retinoic acid, the second step in the oxidation of retinol/vitamin A into retinoic acid. This pathway is crucial to control the levels of retinol and retinoic acid, two important molecules which excess can be teratogenic and cytotoxic. Also oxidizes aldehydes resulting from lipid peroxidation like (E)-4-hydroxynon-2-enal/HNE, malonaldehyde and hexanal that form protein adducts and are highly cytotoxic.

By participating for instance to the clearance of (E)-4-hydroxynon-2-enal/HNE in the lens epithelium prevents the formation of HNE-protein adducts and lens opacification. Functions also downstream of fructosamine-3-kinase in the fructosamine degradation pathway by catalyzing the oxidation of 3-deoxyglucosone, the carbohydrate product of fructosamine 3-phosphate decomposition, which is itself a potent glycating agent that may react with lysine and arginine side-chains of proteins. Has also an aminobutyraldehyde dehydrogenase activity and is probably part of an alternative pathway for the biosynthesis of GABA/4-aminobutanoate in midbrain, thereby playing a role in GABAergic synaptic transmission.

电泳图（SDS-PAGE image）



Greater than 95% as determined by reducing SDS-PAGE.

活性图（Bioactivity image）

$$\text{Specific Activity (pmol/min/ug)} = \frac{\text{Adjusted } V_{max}^{*} \text{ (OD/min) x well volume (L) x } 10^{12} \text{ pmol/mol}}{\text{ext. coeff}^{**} \text{ (M}^{-1}\text{cm}^{-1}\text{) x path corr.}^{***} \text{ (cm) x amount of enzyme (ug)}}$$

*Adjusted for Substrate Blank
**Using the extinction coefficient 6220 $M^{-1}cm^{-1}$
***Using the path correction 0.320 cm

ALDH1A1 (Retinal dehydrogenase 1) which belongs to the aldehyde dehydrogenase family, is the next enzyme after alcohol dehydrogenase in the major pathway of alcohol metabolism. ALDH1A1 converts retinaldehyde to retinoic acid. IL21 (interleukin 21) was identified as an interactor of ALDH1A1 through Affinity Capture-MS. Thus a binding ELISA assay was conducted to detect the interaction of recombinant human ALDH1A1 and recombinant human IL21. Briefly, ALDH1A1 were diluted serially in PBS, with 0.01%BSA (pH 7.4). Duplicate samples of 100uL ALDH1A1 were then transferred to IL21-coated microtiter wells and

incubated for 2h at 37℃. Wells were washed with PBST and incubated for 1h with anti-ALDH1A1 pAb, then aspirated and washed 3 times. After incubation with HRP labelled secondary antibody, wells were aspirated and washed 3 times. With the addition of substrate solution, wells were incubated 15-25 minutes at 37℃. Finally, add 50μL stop solution to the wells and read at 450nm immediately. The binding activity of ALDH1A1 and IL21 was shown in Figure 1, and this effect was in a dose dependent manner. The activity of recombinant human ALDH1A1 was also measured by its ability to produce NADH during the oxidation of propionaldehyde. The reaction was performed in 0.1 M Tris, 0.1 M KCl, 2mM DTT, pH 8.5 (assay buffer), initiated by addition 50 µL of various concentrations of ALDH1A1 (diluted by assay buffer) to 50 µL of substrate mixture 2 mM beta-NAD and 20 mM propionaldehyde. The final well serves as a negative control with no ALDH1A1, replaced with 50 µl assay buffer. Read at a wavelength of 340 nm in kinetic mode for 5 minutes. The specific activity of recombinant human ALDH1A1 is > 130 pmol/min/µg.

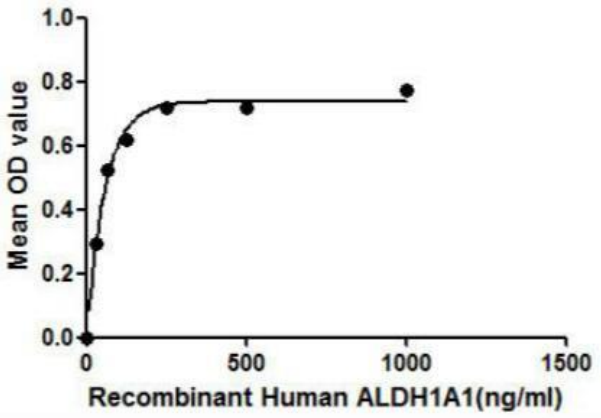


Figure 1. The binding activity of ALDH1A1 with IL21.

注意事项（Note）

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