

ALDH3A1 Protein, Human, Recombinant (His)

General Information

Synonyms:	ALDHIII;aldehyde dehydrogenase 3 family, member A1;ALDH3
Protein Construction:	A DNA sequence encoding the human ALDH3A1 (AAH04370.1) (Met 1-His 453) was fused with a polyhistidine tag at the N-terminus. Predicted N terminal: Met
Species:	Human
Expression Host:	Baculovirus Insect Cells
Accession:	AAH04370.1
Molecular Weight:	52.6 kDa (predicted); 50 kDa (reducing conditions)

QC Testing

Biological Activity:	Activity testing is in progress. It is theoretically active, but we cannot guarantee it. If you require protein activity, we recommend choosing the eukaryotic expression version first.
Purity:	> 90 % as determined by SDS-PAGE
Endotoxin:	< 1.0 EU/μg of the protein as determined by the LAL method.
Formulation:	Lyophilized from a solution filtered through a 0.22 μm filter, containing 20 mM Tris, 500 mM NaCl, pH 7.4, 10% gly. Typically, a mixture containing 5% to 8% trehalose, mannitol, and 0.01% Tween 80 is incorporated as a protective agent before lyophilization.

Preparation and Storage

Reconstitution:
A Certificate of Analysis (CoA) containing reconstitution instructions is included with the products. Please refer to the CoA for detailed information.

Stability & Storage:

It is recommended to store recombinant proteins at -20°C to -80°C for future use. Lyophilized powders can be stably stored for over 12 months, while liquid products can be stored for 6-12 months at -80°C. For reconstituted protein solutions, the solution can be stored at -20°C to -80°C for at least 3 months. Please avoid multiple freeze-thaw cycles and store products in aliquots.

Actual storage temperature shall be subject to the COA.

Shipping:

In general, lyophilized powders are shipped with blue ice, while solutions are shipped with dry ice.

Protein Background

Aldehyde dehydrogenase 3A1 (ALDH3A1) is a metabolic enzyme that catalyzes the oxidation of various aldehydes. Certain types of epithelial tissues in mammals, especially those continually exposed to environmental stress (e.g., corneal epithelium), express ALDH3A1 at high levels and its abundance in such tissues is perceived to help to maintain cellular homeostasis under conditions of oxidative stress. Metabolic as well as non-metabolic roles for ALDH3A1 have been associated with its mediated resistance to cellular oxidative stress. Aldehyde dehydrogenase

1A1 (ALDH1A1) and ALDH3A1 are corneal crystallins. They protect inner ocular tissues from ultraviolet radiation (UVR)-induced oxidative damage through catalytic and non-catalytic mechanisms. Additionally, ALDH3A1 has been postulated to play a regulatory role in the corneal epithelium based on several studies that report an inverse association between ALDH3A1 expression and corneal cell proliferation. Aldehyde dehydrogenase 3A1 (ALDH3A1) plays an important role in many cellular oxidative processes, including cancer chemoresistance, by metabolizing activated forms of oxazaphosphorine drugs such as cyclophosphamide (CP) and its analogues, such as mafosfamide (MF), ifosfamide (IFM), and 4-hydroperoxycyclophosphamide (4-HPCP). Compounds that can selectively target ALDH3A1 could permit delineation of its roles in these processes and could restore chemosensitivity in cancer cells that express this isoenzyme. ALDH3A1 may act to protect corneal cells against cellular oxidative damage by metabolizing toxic lipid peroxidation products (e.g., 4-HNE), maintaining cellular GSH levels and redox balance, and operating as an antioxidant.

Reference

Pappa A, et al. (2003) Human aldehyde dehydrogenase 3A1 (ALDH3A1): biochemical characterization and immunohistochemical localization in the cornea. *Biochem J.* 376(3): 615-23.

Estey T, et al. (2007) ALDH3A1: a corneal crystallin with diverse functions. *Experimental Eye Research.* 84(1):3-12.

Pappa A, et al. (2003) Aldh3a1 protects human corneal epithelial cells from ultraviolet- and 4-hydroxy-2-nonenal-induced oxidative damage. *Free Radical Biology and Medicine.* 34(9):1178-89.

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