Data Sheet (Cat.No.TMPY-01742)

TargetMol

Acetylcholinesterase Protein, Mouse, Recombinant (His)

General Information

Synonyms:	Acre;Chrne;acetylcholinesterase (Yt blood group)
Protein Construction:	A DNA sequence encoding the mouse ACHE (NP_033729.1) (Met 1-Leu 614) was expressed, with a polyhistidine tag at the C-terminus. Predicted N terminal: Glu 32
Species:	Mouse
Expression Host:	HEK293 Cells
Accession:	P21836-1
Molecular Weight:	66.2 kDa (predicted); 66.2 kDa (reducing conditions)

QC Testing

Biological Activity:	Measured by its ability to cleave Acetylthiocholine. The specific activity is > 250 nmols/min/μg.
Purity:	> 95 % 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 PBS, pH 7.4. 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

Acetylcholinesterase, also known as ACHE, is an enzyme that degrades (through its hydrolytic activity) the neurotransmitter acetylcholine, producing choline and an acetate group. Acetylcholinesterase plays a crucial role in nerve impulse transmission at cholinergic synapses by rapid hydrolysis of the neurotransmitter acetylcholine (ACh). ACHE appears to be a potential therapeutic target at muscle injuries including organophosphate myopathy. It is an externally oriented membrane-bound enzyme and its main physiological role is termination of chemical

transmission at cholinergic synapses and secretory organs by rapid hydrolysis of the neurotransmitter acetylcholine (ACh). ACHE plays important roles in the cholinergic system, and its dysregulation is involved in a variety of human diseases. ACHE was significantly down-regulated in the cancerous tissues of 69.2% of hepatocellular carcinoma (HCC) patients, and the low ACHE expression in HCC was correlated with tumor aggressiveness, an elevated risk of postoperative recurrence, and a low survival rate. Both the recombinant ACHE protein and the enhanced expression of ACHE significantly inhibited HCC cell growth in vitro and tumorigenicity in vivo. ACHE as a tumor growth suppressor in regulating cell proliferation, the relevant signaling pathways, and the drug sensitivity of HCC cells. Thus, ACHE is a promising independent prognostic predictor for HCC recurrence and the survival of HCC patients. ACHE is responsible for the hydrolysis of acetylcholine in the nervous system. It is inhibited by organophosphate and carbamate pesticides. However, this enzyme is only slightly inhibited by organophosphorothionates.

Reference

Zhao Y,et al.(2011) Acetylcholinesterase, a key prognostic predictor for hepatocellular carcinoma, suppresses cell growth and induces chemosensitization. Hepatology. 53(2): 493-503.

Roepcke CB,et al.(2010) Analysis of phosphorothionate pesticides using a chloroperoxidase pretreatment and acetylcholinesterase biosensor detection. J Agric Food Chem. 58(15): 8748-56.

Zaheer-ul-Haq,et al.(2010) Benchmarking docking and scoring protocol for the identification of potential acetylcholinesterase inhibitors. J Mol Graph Model. 28(8): 870-82.

Pegan K,et al.(2010) Acetylcholinesterase is involved in apoptosis in the precursors of human muscle regeneration. Chem Biol Interact. 187(1-3): 96-100.