Product Information

Glyceraldehyde-3-phosphate dehydrogenase, human

Recombinant, expressed in *Escherichia coli*

SRE0024

Product Description

CAS Registry Number: 9001-50-7

E.C. 1.2.1.12

Systematic name: D-Glyceraldehyde-3-phosphate:NAD^+ oxidoreductase (phosphorylating)

Synonyms: Triosephosphate dehydrogenase, GAPDH

Storage Temperature: –20 °C

Glyceraldehyde-3-phosphate dehydrogenase (GAPDH), a tetramer of 36 kDa subunits, is a catalytic enzyme involved in glycolysis. GAPDH catalyzes the reversible reduction of glyceraldehyde-3-phosphate to 3-phosphoglycerol phosphate in the presence of NAD+.

Besides functioning as a glycolytic enzyme in the cytoplasm, mammalian GAPDH is also involved in a variety of intracellular processes such as membrane fusion, microtubule bundling, phosphotransferase activity, nuclear RNA export, DNA replication, and DNA repair.[1] Glyceraldehyde-3-phosphate dehydrogenase was also found to bind to mutant polyglutamine proteins formed in neurodegenerative diseases such as Huntington's disease,[2] to bind to the cytoplasmic domain of APP (amyloid precursor protein),[3] and to bind and protect telomeres from chemotherapy-induced rapid degradation.[4] GAPDH has also been suggested as a promising drug target for hepatocellular carcinoma therapy,[5] but has also been shown to have apoptotic activity by its binding to the E3 ubiquitin ligase Siah1.[6]

Several publications cite use of product SRE0024 in their research protocols.[7-9]

Precautions and Disclaimer

This product is for R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Product

This product is a recombinant GAPDH based on the human protein sequence and expressed in *E. coli* with an N-terminal histidine tag. The protein has a predicted molecular mass of 37,984 Da. The product is lyophilized from a buffered solution with stabilizers.

Purity: ≥ 90% (SDS-PAGE)

Specific activity: ≥ 80 units/mg protein

Unit definition: One unit will reduce 1.0 µmole of 3-phosphoglycerate to D-glyceraldehyde 3-phosphate per minute in a coupled system with 3-phosphoglyceric phosphokinase (3-PGK) at pH 7.6 at 25 °C.

Storage/Stability

Store the lyophilized protein at –20 °C. After reconstitution, the enzyme may be stored at 2-8 °C for up to one month or frozen in working aliquots at –20 °C. Repeated freezing and thawing is not recommended.

Preparation Instructions

Dissolve in ultrapure water. If an enzyme concentration of <0.25 mg/mL is required, it is recommended to dilute the enzyme in 100 mM triethanolamine, pH 7.6, with 1 mg/mL BSA.

References

1. Tristan, C. *et al*., *Cell Signal*., **23(2)**, 317-323 (2011).
2. Burke, J. R. *et al*., *Nat. Med*., **2(3)**, 347-350 (1996).
3. Schulze, H. *et al*., *J. Neurochem*., **60(5)**, 1915-1922 (1993).
4. Demarse, N. A. *et al*., *J. Mol. Biol*., **394(4)**, 789-803 (2009).
5. Ganapathy-Kanniappan, S. *et al*., *Oncotarget*, **3(9)**, 940-953 (2012).
6. Hara, M. R. *et al*., *Nat. Cell Biol*., **7(7)**, 665-674 (2005).
7. Ha, J. *et al*., *J. Biol. Chem*., **293(10)**, 3546-3561 (2018).
8. Qian, X. *et al*., *Mol. Cell*, **76(3)**, 516-527.e7 (2019).
9. Rahman, F. *et al*., *Autophagy*, **18(5)**, 1108-1126 (2022).

Notice

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose.

The information in this document is subject to change without notice and should not be construed as a commitment by the manufacturing or selling entity, or an affiliate. We assume no responsibility for any errors that may appear in this document.

Technical Assistance

Visit the tech service page at SigmaAldrich.com/techservice.

Terms and Conditions of Use

Warranty, use restrictions, and other conditions of sale may be found at SigmaAldrich.com/terms.

Contact Information

For the location of the office nearest you, go to SigmaAldrich.com/offices.

SRE0024dat Rev 08/23 DT,SG,GCY,MAM