

Recombinant Mouse E2AK1 Protein

For Research Use Only

1. Basic Product Information

Catalog No.: REP52014

Size: 10ug, 100ug

Protein Name: Eukaryotic translation initiation factor 2-alpha kinase 1 (EC 2.7.11.1) (Heme-controlled repressor) (HCR) (Heme-regulated eukaryotic initiation factor eIF-2-alpha kinase) (Heme-regulated inhibitor) (Hemin-sensitive initiation factor 2-alpha kinase)

Synonym: Eif2ak1, Hri

UniProt ID: Q9Z2R9

UniProt Link: www.uniprot.org/uniprotkb/Q9Z2R9/entry

Species Source: Mouse

Expression System: HEK293T eukaryotic cell expression system Sequence

Length: 619 AA

Molecular Weight: 70 KD

Protein Tag: C-terminal His6

2. Amino Acid Sequence

MLGGSSVDGERDTDDDAAGAVAAPPAIDFPAEVSDPKYDESDVPAELQVLKEPLQQPTFPFLVANQ
LLLVSLLLEHLSHVHEPNPLHSKQVFKLLCQTFIKMGLSSFTCSDEFSSLRLHHNRAITHLMRSAKER
VRQDPCQDNSYMQKIRSREIAFEAQTSRYLNEFEELAILGKGGYGRVYKVRNKLDGQHYAIKKILIKS
ATKTDCKMKVLREVKVLAGLQHPNIVGYHTAWIEHVHVVPQDRVPIQLPSLEVLSEQEGDRDQGGV
KDNESSSSIVFAELTPEKEKPFGESEVKNENNNLVSYTANLVVRNSESSESSIELQEDGLTDLSVRPV
VRHQLPLGHSSELEGNFTSTDESSEGNLNLGQTEVRYHMLHIQMLCELSDLWDWITERNKRSRE
YVDEAACPYVMASVATKIFQELVEGVFYIHNMGIVHRDLKPRNIFLHGPDQQVKIGDFGLACADI IQNA
DWTNRNGKGTTRHTSRVGTCLYASPEQLEGSQYDAKSDMYSLGVILLELFQPFGT EMERATVLTGV
RTGRIPESLSKRCPVQAKYIQLLTGRNVSQRPSALQLLQSELFQTTGNVNLTLQMKIIEQEKEIEELKK
QLSLLSQDRGLKR

3. Buffer Composition

Liquid format: PBS-based buffer containing 50% glycerol. Glycerol concentration can be customized upon customer request; please state special requirements when placing your order.



Lyophilized format: Buffer before lyophilization is PBS supplemented with 6% trehalose.

4. Storage Conditions

Upon receipt, store the product at -20 °C or -80 °C. Aliquot the product for on-demand use to preserve protein activity and prevent denaturation and inactivation caused by repeated freeze-thaw cycles.

5. Product Description

This product is recombinant Eukaryotic translation initiation factor 2-alpha kinase 1 (EC 2.7.11.1) (Heme-controlled repressor) (HCR) (Heme-regulated eukaryotic initiation factor eIF-2-alpha kinase) (Heme-regulated inhibitor) (Hemin-sensitive initiation factor 2-alpha kinase) produced using the HEK293T eukaryotic cell expression system. It is suitable for in-vitro functional assays, protein-protein interaction studies, antibody preparation and other biomedical research applications.

Protein Function: Metabolic-stress sensing protein kinase that phosphorylates the alpha subunit of eukaryotic translation initiation factor 2 (EIF2S1/eIF-2-alpha) in response to various stress conditions (PubMed:11726526, PubMed:12767237, PubMed:16893190). Key activator of the integrated stress response (ISR) required for adaptation to various stress, such as heme deficiency, oxidative stress, osmotic shock, mitochondrial dysfunction and heat shock (PubMed:11726526, PubMed:16893190). EIF2S1/eIF-2-alpha phosphorylation in response to stress converts EIF2S1/eIF-2-alpha in a global protein synthesis inhibitor, leading to a global attenuation of cap-dependent translation, while concomitantly initiating the preferential translation of ISR-specific mRNAs, such as the transcriptional activator ATF4, and hence allowing ATF4-mediated reprogramming (PubMed:11726526, PubMed:16893190). Acts as a key sensor of heme-deficiency: in normal conditions, binds heme via a cysteine thiolate and histidine nitrogenous coordination, leading to inhibit the protein kinase activity (PubMed:16893190). This binding occurs with moderate affinity, allowing it to sense the heme concentration within the cell: heme depletion relieves inhibition and stimulates kinase activity, activating the ISR (PubMed:16893190). Thanks to this unique heme-sensing capacity, plays a crucial role to shut off protein synthesis during acute heme-deficient conditions (PubMed:16893190). In red blood cells (RBCs), controls hemoglobin synthesis ensuring a coordinated regulation of the synthesis of its heme and globin moieties (PubMed:11050009, PubMed:11726526, PubMed:15931390). It thereby plays an essential protective role for RBC survival in anemias of iron deficiency (PubMed:11726526). Iron deficiency also triggers activation by full-length DELE1 (By similarity). Also activates the ISR in response to mitochondrial dysHRI/EIF2AK1 protein kinase activity is activated upon binding to the processed form of DELE1 (S-DELE1), thereby promoting the ATF4-mediated reprogramming (By similarity). Also acts as an activator of mitophagy in response to mitochondrial damage: catalyzes phosphorylation of eIF-2-alpha (EIF2S1) following activation by S-DELE1, thereby promoting mitochondrial localization of EIF2S1, triggering PRKN-independent mitophagy (By similarity).

Subcellular Localization: Cytoplasm .

6. Notes

- Avoid repeated freeze-thaw cycles to maintain protein stability and biological activity.
- Please specify special buffer-composition requirements at the time of order placement.
- For research use only. Not intended for clinical diagnosis, therapeutic use or commercial manufacturing.