

# Recombinant Human EIF2AK1 Protein (S161-S586), His/GST tagged

**Cat. No.** EIF2AK1-0680H    **Lot. No.** (See product label)

## SPECIFICATION

### Product Overview

Recombinant Human 6His-GST-3C-HRI(S161-S586) (delta V237-Y376) (D442N)  
Protein was expressed in E. coli.

### Species

Human

### Source

E.coli

### ProteinLength

S161-S586

### Description

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. 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. 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. Acts as a key sensor of heme-deficiency: in normal conditions, binds hemin via a cysteine thiolate and histidine nitrogenous coordination, leading to inhibit the protein kinase activity. 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. Thanks to this unique heme-sensing capacity,

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plays a crucial role to shut off protein synthesis during acute heme-deficient conditions. In red blood cells (RBCs), controls hemoglobin synthesis ensuring a coordinated regulation of the synthesis of its heme and globin moieties. It thereby plays an essential protective role for RBC survival in anemias of iron deficiency. Similarly, in hepatocytes, involved in heme-mediated translational control of CYP2B and CYP3A and possibly other hepatic P450 cytochromes. May also regulate endoplasmic reticulum (ER) stress during acute heme-deficient conditions. Also activates the ISR in response to mitochondrial dysfunction: HRI/EIF2AK1 protein kinase activity is activated upon binding to the processed form of DELE1 (S-DELE1), thereby promoting the ATF4-mediated reprogramming.

|                       |   |
|-----------------------|---|
| <b>Form</b>           | Liquid  |
| <b>Endotoxin</b>      | < 0.01 EU per µg of the protein   |
| <b>Purity</b>         | 90%   |
| <b>Stability</b>      | Samples are stable for up to twelve months from date of receipt at -20 to -80 centigrade.   |
| <b>Storage</b>        | Store it under sterile conditions at -20 to -80 centigrade. It is recommended that the protein be aliquoted for optimal storage. Avoid repeated freeze-thaw cycles. |
| <b>Storage Buffer</b> | Supplied as sterile 50 mM Tris-HCl (pH7.5), 200 mM NaCl, 20% glycerol   |
| <b>Shipping</b>       | It is shipped out with blue ice.  |

## GENE INFORMATION

**Gene Name** EIF2AK1 eukaryotic translation initiation factor 2-alpha kinase 1 [ Homo sapiens (human) ]

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|                        |  |
|------------------------|--|
| <b>Official Symbol</b> | EIF2AK1  |
| <b>Synonyms</b>        | EIF2AK1; eukaryotic translation initiation factor 2-alpha kinase 1; heme regulated initiation factor 2 alpha kinase; HRI; KIAA1369; heme-regulated inhibitor; heme-regulated repressor; heme-controlled repressor; heme sensitive initiation factor 2a kinase; heme-regulated initiation factor 2-alpha kinase; hemin-sensitive initiation factor 2-alpha kinase; heme-regulated eukaryotic initiation factor eIF-2-alpha kinase; HCR; |
| <b>Gene ID</b>         | 27102  |
| <b>mRNA Refseq</b>     | NM_001134335   |
| <b>Protein Refseq</b>  | NP_001127807   |
| <b>MIM</b>             | 613635   |
| <b>UniProt ID</b>      | Q9BQI3   |

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