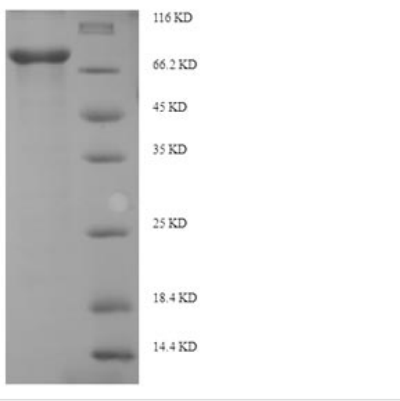
Recombinant Human Interferon-induced, double-stranded RNA-activated protein kinase (EIF2AK2)

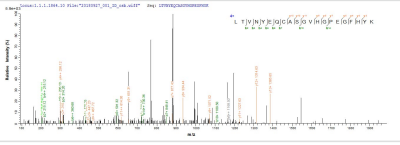
Product Code	CSB-EP007511HU
Relevance	IFN-induced dsRNA-dependent serine/threonine-protein kinase which plays a key role in the innate immune response to viral infection and is also involved in the regulation of signal transduction, apoptosis, cell proliferation and differentiation. Exerts its antiviral activity on a wide range of DNA and RNA viruses including hepatitis C virus (HCV), hepatitis B virus (HBV), measles virus (MV) and herpes simplex virus 1 (HHV-1). Inhibits viral replication via phosphorylation of the alpha subunit of eukaryotic initiation factor 2 (EIF2S1), this phosphorylation impairs the recycling of EIF2S1 between successive rounds of initiation leading to inhibition of translation which eventually results in shutdown of cellular and viral protein synthesis. Also phosphorylates other substrates including p53/TP53, PPP2R5A, DHX9, ILF3, IRS1 and the HHV-1 viral protein US11. In addition to serine/threonine-protein kinase activity, also has tyrosine-protein kinase activity and phosphorylates CDK1 at 'Tyr-4' upon DNA damage, facilitating its ubiquitination and proteosomal degradation. Either as an adapter protein and/or via its kinase activity, can regulate various signaling pathways (p38 MAP kinase, NF-kappa-B and insulin signaling pathways) and transcription factors (JUN, STAT1, STAT3, IRF1, ATF3) involved in the expression of genes encoding proinflammatory cytokines and IFNs. Activates the NF-kappa-B pathway via interaction with IKBKB and TRAF family of proteins and activates the p38 MAP kinase pathway via interaction with MAP2K6. Can act as both a positive and negative regulator of the insulin signaling pathway (ISP). Negatively regulates ISP by inducing the inhibitory phosphorylation of insulin receptor substrate 1 (IRS1) at 'Ser-312' and positively regulates ISP via phosphorylation of PPP2R5A which activates FOXO1, which in turn up-regulates the expression of insulin receptor substrate 2 (IRS2). Can regulate NLRP3 inflammasome assbly and the activation of NLRP3, NLRP1, AIM2 and NLRC4 inflammasomes. Can trigger apoptosis via FADD-mediated activation of CASP8. Plays a role in the regulation of the cytoskeleton by binding to gelsolin (GSN), sequestering the protein in an inactive conformation away from actin
Abbreviation	Recombinant Human EIF2AK2 protein
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P19525
Alias	Eukaryotic translation initiation factor 2-alpha kinase 2
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)

Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	AGDLSAGFFMEELNTYRQKQGVVLKYQELPNSGPPHDRRFTFQVIIDGREFPE GEGRSKKEAKNAAAKLAVEILNKEKKAVSPLLLTTTNSSEGLSMGNYIGLINRIA QKKRLTVNYEQCASGVHGPEGFHYKCKMGQKEYSIGTGSTKQEAKQLAAKLA YLQILSEETSVKSDYLSSGSFATTCESQSNSLVTSTLASESSSEGDFSADTSEI NSNSDSLNSSSLLMNGLRNNQRKAKRSLAPRFDLPDMKETKYTVDKRFGMDF KEIELIGSGGFGQVFKAKHRIDGKTYVIKRVKYNNEKAEREVKALAKLDHVNIVH YNGCWDGFDYDPETSDDSLESSDYDPENSKNSSRSKTKCLFIQMEFCDKGTL EQWIEKRRGEKLDKVLALELFEQITKGVDYIHSKKLIHRDLKPSNIFLVDTKQVKI GDFGLVTSLKNDGKRTRSKGTLRYMSPEQISSQDYGKEVDLYALGLILAELLHV CDTAFETSKFFTDLRDGIISDIFDKKEKTLLQKLLSKKPEDRPNTSEILRTLTVWK KSPEKNERHTC
Research Area	Signal Transduction
Source	E.coli
Target Names	EIF2AK2
Protein Names	Recommended name: Interferon-induced, double-stranded RNA-activated protein kinase EC= 2.7.11.1 Alternative name(s): Eukaryotic translation initiation factor 2-alpha kinase 2 Short name= eIF-2A protein kinase 2 Interferon-inducib
Expression Region	2-551aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-SUMO-tagged
Mol. Weight	78.0kDa
Protein Length	Full Length of Mature Protein

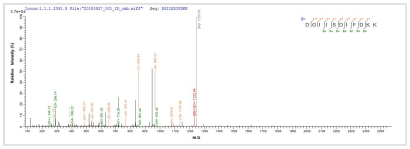
Image



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.



Based on the SEQUEST from database of E.coli host and target protein, the LC-MS/MS Analysis result of CSB-EP007511HU could indicate that this peptide derived from E.coli-expressed Homo sapiens (Human) EIF2AK2.



Based on the SEQUEST from database of E.coli host and target protein, the LC-MS/MS Analysis result of CSB-EP007511HU could indicate that this peptide derived from E.coli-expressed Homo sapiens (Human) EIF2AK2.

Description

Full-length of mature human interferon-induced, double-stranded RNA-activated protein kinase EIF2AK2 cDNA carrying an N-terminal 6xHis-SUMO-tag was expressed in E.coli. The resulting protein is the recombinant fusion protein consisting of 2-551aa of human EIF2AK2. It was validated by both SDS-PAGE and LC-MS/MS analyses. The SDS-PAGE showed an about 75-85 kDa molecular mass of this protein and determines the purity of over 90%. In addition to being an immunogen for specific antibody synthesis, this recombinant protein also may be used in the studies of EIF2AK2-mediated signal transduction.

EIF2AK2, also called PKR, is activated by double-stranded RNA (dsRNA) and blocks the translation of viral mRNA in response to infection and physiologic stress conditions. It is also involved in innate immune response and the modulation of signal transduction, apoptosis, cell proliferation, and differentiation. Dongxue Mao etc. demonstrated that EIF2AK2 missense variants lead to a neurodevelopmental syndrome that may share phenotypic and pathogenic mechanisms with childhood ataxia with central nervous system hypomyelination/vanishing white matter disease (CACH/VWM).

Reconstitution

We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL.We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.

Shelf Life

The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself.
Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.