EIF2AK2 Protein, Human (P. pastoris, His)

Cat. No.:	HY-P700582
Synonyms:	eukaryotic translation initiation factor 2-alpha kinase 2; PRKR, protein kinase, interferon inducible double stranded RNA dependent; interferon-induced, double-stranded RNA-activated protein kinase; EIF2AK1; PKR; p68 kinase; eIF-2A protein kinase 2; P1/eIF-2A protein kinase; tyrosine-protein kinase EIF2AK2; interferon-inducible elF2alpha kinase; double stranded RNA activated protein kinase; protein kinase, interferon-inducible double stranded RNA dependent; PRKR; MGC126524;
Species:	Human
Source:	P. pastoris
Accession:	P19525 (A2-C551)
Gene ID:	5610
Molecular Weight:	64 kDa

PROPERTIES

AA Sequence

A G D L S A G F F M E E L N T Y R Q K Q G V V L K Y Q E L P N S G P P H D R R F
T F Q V I I D G R E F P E G E G R S K K E A K N A A A K L A V E I L N K E K K A
V S P L L L T T T N S S E G L S M G N Y I G L I N R I A Q K K R L T V N Y E Q C
A S G V H G P E G F H Y K C K M G Q K E Y S I G T G S T K Q E A K Q L A A K L A
Y L Q I L S E E T S V K S D Y L S S G S F A T T C E S Q S N S L V T S T L A S E
S S S E G D F S A D T S E I N S N S D S L N S S S L L M N G L R N N Q R K A K R
S L A P R F D L P D M K E T K Y T V D K R F G M D F K E I E L I G S G G F G Q V
F K A K H R I D G K T Y V I K R V K Y N N E K A E R E V K A L A K L D H V N I V
H Y N G C W D G F D Y D P E T S D D S L E S S D Y D P E N S K N S S R S K T K C
L F I Q M E F C D K G T L E Q W I E K R R G E K L D K V L A L E L F E Q I T K G
V D Y I H S K K L I H R D L K P S N I F L V D T K Q V K I G D F G L V T S L K N
D G K R T R S K G T L R Y M S P E Q I S S Q D Y G K E V D L Y A L G L I L A E L
L H V C D T A F E T S K F F T D L R D G I I S D I F D K K E K T L L Q K L L S K
K P E D R P N T S E I L R T L T V W K K S P E K N E R H T C

Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 μm filtered solution of Tris/PBS-based buffer, 6% Trehalose, pH 8.0.
Endotoxin Level	<1 EU/μg, determined by LAL method.
Reconsititution	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH_2O.
Storage & Stability	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
Shipping	Room temperature in continental US; may vary elsewhere.

DESCRIPTION

Background	EIF2AK2 Protein, an interferon-induced dsRNA-dependent serine/threonine-protein kinase, stands at the forefront of the innate immune response to viral infections. Upon viral challenge, EIF2AK2 phosphorylates the alpha subunit of eukaryotic translation initiation factor 2 (EIF2S1/eIF-2-alpha), initiating the integrated stress response (ISR). This response acts as a potent antiviral strategy by converting EIF2S1/eIF-2-alpha into a global protein synthesis inhibitor, leading to the shutdown of cellular and viral protein synthesis. Concurrently, ISR-specific mRNAs, such as the transcriptional activator ATF4, are preferentially translated, orchestrating a multifaceted defense mechanism. EIF2AK2's antiviral activity extends to a wide array of DNA and RNA viruses, including HCV, HBV, MV, and HHV-1. Beyond its role in antiviral defense, EIF2AK2 regulates signal transduction, apoptosis, cell proliferation, and differentiation. Its versatile kinase activity targets substrates like p53/TP53, PPP2R5A, DHX9, ILF3, IRS1, and the HHV-1 viral protein US11. Notably, EIF2AK2's impact extends to the modulation of various signaling pathways (p38 MAP kinase, NF-kappa-B, and insulin signaling) and transcription factors (JUN, STAT1, STAT3, IRF1, ATF3) involved in the expression of pro-inflammatory cytokines and IFNs. It acts as a versatile regulator, positively and negatively influencing the insulin signaling pathway and playing a role in the assembly and activation of inflammasomes. Moreover, EIF2AK2 contributes to the regulation of the cytoskeleton by binding to gelsolin (GSN), modulating its activity and impacting actin dynamics (By similarity).

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