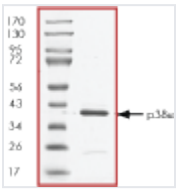
p38 alpha Recombinant Protein

PRODUCT OVERVIEW

Product Name	p38 alpha, Recombinant Protein
Full Product Name	p38 alpha, Unactive recombinant protein
Product Gene Name	p38 alpha recombinant protein
Product Synonym Gene Name	CSBP1;CSBP2;CSPB1;PRKM14;PRKM15;SAPK2A;MAPK14
Product Synonym Names	CSBP1;CSBP2;CSPB1;PRKM14;PRKM15;SAPK2A;MAPK14; p38alpha; Unactive; p38a; Unactive
Host	E Coli
Form/Format	Recombinant protein stored in 50mM Tris-HCl, pH 7.5, 150mM NaCl, 0.25mM DTT, 0.1mM EGTA, 0.1mM EDTA, 0.1mM PMSF, 25% glycerol.
Purity/Purification	>90%
Concentration	0.2ug/ul (lot specific)
Preparation and Storage	1 yr at -70 degree C from date of shipment. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles. Shipping: Ships with Dry Ice.
Molecular Weight	~38 kDa
Chromosome Location	Chromosome: 6; NC_000006.11 (35995412..36079013). Location: 6p21.3-p21.2
OMIM	600289
3D Structure	ModBase 3D Structure for Q16539
Type	Recombinant Fusion Protein
Species	Human
Tag Information	tag-free
Expression System	E.coli
Source Note	Recombinant full-length human p38alpha expressed in E. coli cells
Accession Number	NM 139012
Gene Aliases	CSBP1; CSBP2; CSBP1; PRKM15; SAPK2A; MAPK14
Dry Ice Shipment	Extra charge fee may add to your shipping cost as dry ice is required to ship this product.
Product Categories/Family for p38 alpha recombinant protein	Unactive Kinase; Signaling Proteins - Unactive Kinases
Applications Tested/Suitable for p38 alpha recombinant protein	Kinase Assay, Western Blot (WB)

Related Product Information for p38 alpha recombinant protein	Recombinant full-length, tag-free human p38alpha was expressed in E. coli cells. **Scientific Background:** p38? (SAPK2A) is a member of the p38 MAPK family which are activated by various environmental stresses and proinflammatory cytokines (1). The activation of p38 requires its phosphorylation by MAP kinase kinases (MKKs), or its autophosphorylation triggered by the interaction of MAP3K7IP1/TAB1 protein with this kinase (2). The substrates of p38 include transcription regulator ATF2, MEF2C, and MAX, cell cycle regulator CDC25B, and tumor suppressor p53, which suggest the roles of this kinase in stress related transcription and cell cycle regulation, as well as in genotoxic stress response (5).
Product References and Citations for p38 alpha recombinant protein	1. Han, J. et al: A MAP kinase targeted by endotoxin and hyperosmolarity in mammalian cells. Science 265: 808-811, 1994. 2. Ge, B. et al: MAPKK-independent activation of p38-alpha mediated by TAB1-dependent autophosphorylation of p38-alpha. Science 295: 1291-1294, 2002.
Other Notes	Small volumes of p38 alpha recombinant protein vial(s) may occasionally become entrapped in the seal of the product vial during shipment and storage. If necessary, briefly centrifuge the vial on a tabletop centrifuge to dislodge any liquid in the container`s cap. Certain products may require to ship with dry ice and additional dry ice fee may apply.
Searchable Terms for p38 alpha purchase	MBS515358 is a recombinant protein targeting p38 alpha. Also known as p38 alpha, Unactive recombinant protein. Host: E Coli.



SDS-PAGE of p38 alpha recombinant protein
The purity was determined to be >90% by densitometry. Approx. MW 38kDa

ADDITIONAL DETAILS

NCBI/Uniprot data below describe general gene information for p38 alpha. It may not necessarily be applicable to this product.

NCBI GI #	194578900
NCBI GeneID	1432
NCBI Accession #	NP_620581.1
UniProt Primary Accession #	Q16539
UniProt Secondary Accession #	O60776; Q13083; Q14084; Q8TDX0; A6ZJ92; A8K6P4; B0LPH0
UniProt Related Accession #	Q16539
GenBank Nucleotide #	NM_139012
NCBI Official Full Name	Homo sapiens mitogen-activated protein kinase 14 (MAPK14), transcript variant 2, mRNA
NCBI Official Synonym Full Names	mitogen-activated protein kinase 14
NCBI Official Symbol	MAPK14
NCBI Official Synonym Symbols	RK; p38; CSBP; EXIP; Mxi2; CSBP1; CSBP2; CSPB1; PRKM14; PRKM15; SAPK2A; p38ALPHA
UniProt Protein Name	Mitogen-activated protein kinase 14
UniProt Synonym Protein Names	Cytokine suppressive anti-inflammatory drug-binding protein; CSAID-binding protein; CSBP; MAP kinase MXI2; MAX-interacting protein 2; Mitogen-activated protein kinase p38 alpha; MAP kinase p38 alpha; Stress-activated protein kinase 2a
UniProt Gene Name	MAPK14
UniProt Synonym Gene Names	CSBP; CSBP1; CSBP2; CSPB1; MXI2; SAPK2A; MAP kinase 14; MAPK 14; CSAID-binding protein; CSBP; MAP kinase p38 alpha; SAPK2a

UniProt Entry Name	MK14_HUMAN
NCBI Protein Information	mitogen-activated protein kinase 14; MAP kinase 14; p38alpha Exip; p38 MAP kinase; MAP kinase Mxi2; MAP kinase p38 alpha; CSAID-binding protein; Csaids binding protein; MAX-interacting protein 2; stress-activated protein kinase 2A; p38 mitogen activated protein kinase; mitogen-activated protein kinase p38 alpha; cytokine suppressive anti-inflammatory drug binding protein; cytokine suppressive anti-inflammatory drug-binding protein
NCBI Summary for p38 alpha	The protein encoded by this gene is a member of the MAP kinase family. MAP kinases act as an integration point for multiple biochemical signals, and are involved in a wide variety of cellular processes such as proliferation, differentiation, transcription regulation and development. This kinase is activated by various environmental stresses and proinflammatory cytokines. The activation requires its phosphorylation by MAP kinase kinases (MKKs), or its autophosphorylation triggered by the interaction of MAP3K7IP1/TAB1 protein with this kinase. The substrates of this kinase include transcription regulator ATF2, MEF2C, and MAX, cell cycle regulator CDC25B, and tumor suppressor p53, which suggest the roles of this kinase in stress related transcription and cell cycle regulation, as well as in genotoxic stress response. Four alternatively spliced transcript variants of this gene encoding distinct isoforms have been reported. [provided by RefSeq, Jul 2008]

UniProt Comments for p38 alpha

Function: Serine/threonine kinase which acts as an essential component of the MAP kinase signal transduction pathway. MAPK14 is one of the four p38 MAPKs which play an important role in the cascades of cellular responses evoked by extracellular stimuli such as proinflammatory cytokines or physical stress leading to direct activation of transcription factors. Accordingly, p38 MAPKs phosphorylate a broad range of proteins and it has been estimated that they may have approximately 200 to 300 substrates each. Some of the targets are downstream kinases which are activated through phosphorylation and further phosphorylate additional targets. RPS6KA5/MSK1 and RPS6KA4/MSK2 can directly phosphorylate and activate transcription factors such as CREB1, ATF1, the NF-kappa-B isoform RELA/NFKB3, STAT1 and STAT3, but can also phosphorylate histone H3 and the nucleosomal protein HMGN1. RPS6KA5/MSK1 and RPS6KA4/MSK2 play important roles in the rapid induction of immediate-early genes in response to stress or mitogenic stimuli, either by inducing chromatin remodeling or by recruiting the transcription machinery. On the other hand, two other kinase targets, MAPKAPK2/MK2 and MAPKAPK3/MK3, participate in the control of gene expression mostly at the post-transcriptional level, by phosphorylating ZFP36 (tristetraprolin) and ELAVL1, and by regulating EEF2K, which is important for the elongation of mRNA during translation. MKNK1/MNK1 and MKNK2/MNK2, two other kinases activated by p38 MAPKs, regulate protein synthesis by phosphorylating the initiation factor EIF4E2. MAPK14 interacts also with casein kinase II, leading to its activation through autophosphorylation and further phosphorylation of TP53/p53. In the cytoplasm, the p38 MAPK pathway is an important regulator of protein turnover. For example, CFLAR is an inhibitor of TNF-induced apoptosis whose proteasome-mediated degradation is regulated by p38 MAPK phosphorylation. In a similar way, MAPK14 phosphorylates the ubiquitin ligase SIAH2, regulating its activity towards EGLN3. MAPK14 may also inhibit the lysosomal degradation pathway of autophagy by interfering with the intracellular trafficking of the transmembrane protein ATG9. Another function of MAPK14 is to regulate the endocytosis of membrane receptors by different mechanisms that impinge on the small GTPase RAB5A. In addition, clathrin-mediated EGFR internalization induced by inflammatory cytokines and UV irradiation depends on MAPK14-mediated phosphorylation of EGFR itself as well as of RAB5A effectors. Ectodomain shedding of transmembrane proteins is regulated by p38 MAPKs as well. In response to inflammatory stimuli, p38 MAPKs phosphorylate the membrane-associated metalloprotease ADAM17. Such phosphorylation is required for ADAM17-mediated ectodomain shedding of TGF-alpha family ligands, which results in the activation of EGFR signaling and cell proliferation. Another p38 MAPK substrate is FGFR1. FGFR1 can be translocated from the extracellular space into the cytosol and nucleus of target cells, and regulates processes such as rRNA synthesis and cell growth. FGFR1 translocation requires p38 MAPK activation. In the nucleus, many transcription factors are phosphorylated and activated by p38 MAPKs in response to different stimuli. Classical examples include ATF1, ATF2, ATF6, ELK1, PTPRH, DDIT3, TP53/p53 and MEF2C and MEF2A. The p38 MAPKs are emerging as important modulators of gene expression by regulating chromatin modifiers and remodelers. The promoters of several genes involved in the inflammatory response, such as IL6, IL8 and IL12B, display a p38 MAPK-dependent enrichment of histone H3 phosphorylation on 'Ser-10' (H3S10ph) in LPS-stimulated myeloid cells. This phosphorylation enhances the accessibility of the cryptic NF-kappa-B-binding sites marking promoters for increased NF-kappa-B recruitment. Phosphorylates CDC25B and CDC25C which is required for binding to 14-3-3 proteins and leads to initiation of a G2 delay after ultraviolet radiation. Phosphorylates TIAR following DNA damage, releasing TIAR from GADD45A mRNA and preventing mRNA degradation. The p38 MAPKs may also have kinase-independent roles, which are thought to be due to the binding to targets in the absence of phosphorylation. Protein O-Glc-N-acylation catalyzed by the OGT is regulated by MAPK14, and, although OGT does not seem to be phosphorylated by MAPK14, their interaction increases upon MAPK14 activation induced by glucose deprivation. This interaction may regulate OGT activity by recruiting it to specific targets such as neurofilament H, stimulating its O-Glc-N-acylation. Required in mid-fetal development for the growth of embryo-derived blood vessels in the labyrinth layer of the placenta. Also plays an essential role in developmental and stress-induced erythropoiesis, through regulation of EPO gene expression. Isoform MXI2 activation is stimulated by mitogens and oxidative stress and only poorly phosphorylates ELK1 and ATF2. Isoform EXIP may play a role in the early onset of apoptosis. Phosphorylates S100A9 at 'Thr-113'. Ref.18 Ref.19 Ref.20 Ref.22 Ref.23 Ref.24 Ref.25 Ref.26 Ref.30 Ref.31 Ref.34 Ref.39 Ref.40 Ref.42 Ref.49 Ref.50 Ref.51

Catalytic activity: ATP + a protein = ADP + a phosphoprotein.

Cofactor: Magnesium. Ref.25

Enzyme regulation: Activated by cell stresses such as DNA damage, heat shock, osmotic shock, anisomycin and sodium arsenite, as well as pro-inflammatory stimuli such as bacterial lipopolysaccharide (LPS) and interleukin-1. Activation occurs through dual phosphorylation of Thr-180 and Tyr-182 by either of two dual specificity kinases, MAP2K3/MKK3 or MAP2K6/MKK6, and potentially also MAP2K4/MKK4, as well as by TAB1-mediated autophosphorylation. MAPK14 phosphorylated on both Thr-180 and Tyr-182 is 10-20-fold more active than MAPK14 phosphorylated only on Thr-180, whereas MAPK14 phosphorylated on Tyr-182 alone is inactive. whereas Thr-180 is necessary for catalysis, Tyr-182 may be required for auto-activation and substrate recognition. Phosphorylated at Tyr-323 by ZAP70 in an alternative activation pathway in response to TCR signaling in T-cells. This alternative pathway is inhibited by GADD45A. Inhibited by dual specificity phosphatases, such as DUSP1, DUSP10, and DUSP16. Specifically inhibited by the binding of pyridinyl-imidazole compounds, which are cytokine-suppressive anti-inflammatory drugs (CSAID). Isoform Mxi2 is 100-fold less sensitive to these agents than the other isoforms and is not inhibited by DUSP1. Isoform Exip is not activated by MAP2K6. SB203580 is an inhibitor of MAPK14. Ref.5 Ref.15 Ref.17 Ref.19 Ref.21 Ref.25 Ref.28 Ref.29 Ref.32 Ref.36 Ref.37 Ref.40 Ref.61 Ref.62 Ref.63 Ref.65 Ref.67 Ref.68

Subunit structure: Binds to a kinase interaction motif within the protein tyrosine phosphatase, PTPRR

Research Articles on p38 alpha	**1.** MAPK14-mediated phosphorylation of ATG5 has a role in inhibiting autophagocytosis
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