MAPK14 Positive Control – Phospho

PRODUCT OVERVIEW

Product Name	Phospho-MAPK14, Positive Control
Full Product Name	Phospho MAPK14 Antibody Western Blot Positive Control
Product Gene Name	MAPK14 positive control
Product Synonym Names	CSAID-binding protein; CSBP; CSBP1; CSBP2; Cytokine suppressive anti-inflammatory drug-binding protein; EXIP; MAP kinase 14; MAP kinase MXI2; MAP kinase p38 alpha; MAPK14; MAX-interacting protein 2; Mitogen-activated protein kinase 14; Mitogen-activated protein kinase p38 alpha; Mxi2; p38; p38 MAP kinase; p38 mitogen activated protein kinase; p38alpha Exip; PRKM14; PRKM15; RK; SAPK2A; Stress-activated protein kinase 2a antibody
Form/Format	Western Blot Positive Control
Preparation and Storage	-20• degree C for long term storage
Matching Pairs	Antibody: Phospho-MAPK14 (MBS543965) Positive Control: Phospho-MAPK14 (MBS543140)
Matching Pairs	Antibody: Phospho-MAPK14 (MBS543966) Positive Control: Phospho-MAPK14 (MBS543140)
Matching Pairs	Antibody: Phospho-MAPK14 (MBS543967) Positive Control: Phospho-MAPK14 (MBS543140)
Molecular Weight	29,388 Da
OMIM	600289
3D Structure	ModBase 3D Structure for Q16539
Immunogen	Purified Protein
Expression	Brain, heart, placenta, pancreas and skeletal muscle. Expressed to a lesser extent in lung, liver and kidney.
Molecular Function	ATP binding; MAP kinase activity; MAP kinase kinase activity; NFAT protein binding; Protein serine/threonine kinase activity
Structure	Binds to a kinase interaction motif within the protein tyrosine phosphatase, PTPRR (By similarity). This interaction retains MAPK14 in the cytoplasm and prevents nuclear accumulation (By similarity). Interacts with SPAG9 and GADD45A (By similarity). Interacts with CDC25B, CDC25C, DUSP1, DUSP10, DUSP16, NP60, SUPT20H and TAB1. Interacts with casein kinase II subunits CSNK2A1 and CSNK2B.
Subcellular Location	Cytoplasm; Nucleus
Applications Tested/Suitable for MAPK14 positive control	Western Blot (WB)
Application Notes for MAPK14 positive control	Western Blot: 1:500-1:1,000

Related Product Information for MAPK14 positive control	Western Blot Positive Control Phospho p38 Mitogen Activated Protein Kinase 14 Antibody 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. 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. 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.
Other Notes	Small volumes of MAPK14 positive control 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 MAPK14 purchase	MBS543140 is a positive control targeting MAPK14. Also known as Phospho MAPK14 Antibody Western Blot Positive Control.

ADDITIONAL DETAILS

NCBI/Uniprot data below describe general gene information for MAPK14. It may not necessarily be applicable to this product.

NCBI GI #	4503069
NCBI GeneID	1432
NCBI Accession #	NP_001306
UniProt Primary Accession #	Q16539
UniProt Secondary Accession #	O60776; Q13083; Q14084; Q8TDX0; A6ZJ92; A8K6P4; B0LPH0; B5TY32
UniProt Related Accession #	Q16539
GenBank Nucleotide #	NM_001315.2
NCBI Official Full Name	mitogen-activated protein kinase 14 isoform 1
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; SAPK2a
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
NCBI Summary for MAPK14	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 MAPK14	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'.
Research Articles on MAPK14	**1.** Knockdown of Wip1 enhances sensitivity to radiation in HeLa cells by inhibiting cell proliferation and inducing apoptosis through activation of p38 MAPK.
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