abcam

ab182453

Anti-p38 alpha/MAPK14 antibody [EPR16878]

Recombinant | RabMAb | KO Validated | 20ul selling size

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	pH: 7.2 Preservative: 0.01% Sodium azide Constituents: PBS, 40% Glycerol (glycerin, glycerine), 0.05% BSA
Form	Liquid
Clonality	Monoclonal
Immunogen	The exact immunogen used to generate this antibody is proprietary information.
Clone number	EPR16878
Purification technique	Affinity purification Protein A
Concentration	1.803 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IP

Tested

Species	Human
Dilution info	1/100
Notes	-

Expected

Species	Mouse, Rat
Dilution info	Use at an assay dependent concentration.
Notes	-

WB

Tested

Species	Mouse
Dilution info	1/1000
Notes	-

Species	Rat
Dilution info	1/1000
Notes	-

Species	Human
Dilution info	1/1000
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/500
Notes	-

Expected

Species	Mouse, Rat
Dilution info	Use at an assay dependent concentration.
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/180
Notes	-

Expected

Species	Mouse, Rat
Dilution info	Use at an assay dependent concentration.
Notes	-

Target data

See full target information MAPK14

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 pro-inflammatory 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 (PubMed:9687510, PubMed:9792677). 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 (PubMed:9687510, PubMed:9792677). 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 (PubMed:11154262). MAPK14 also interacts with casein kinase II, leading to its activation through autophosphorylation and further phosphorylation of TP53/p53 (PubMed:10747897). 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 (PubMed:17003045). MAPK14 may also inhibit the lysosomal degradation pathway of autophagy by interfering with the intracellular trafficking of the transmembrane protein ATG9

(PubMed:19893488). 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 (PubMed:16932740). 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 (PubMed:20188673). 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 (PubMed:10330143, PubMed:9430721, PubMed:9858528). 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 (PubMed:11333986). Phosphorylates TIAR following DNA damage, releasing TIAR from GADD45A mRNA and preventing mRNA degradation (PubMed:20932473). 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 (PubMed:10943842). 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' (PubMed:15905572). Phosphorylates NLRP1 downstream of MAP3K20/ZAK in response to UV-B irradiation and ribosome collisions, promoting activation of the NLRP1 inflammasome and pyroptosis (PubMed:35857590). (Microbial infection) Activated by phosphorylation by M.tuberculosis EsxA in T-cells leading to inhibition of IFN-gamma production; phosphorylation is apparent within 15 minutes and is inhibited by kinase-specific inhibitors SB203580 and siRNA (PubMed:21586573).

Storage

Shipped at conditions	Conditional Ambient

Appropriate short-term storage duration	1-2 weeks
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot
Storage information	Avoid freeze / thaw cycle

Notes

Patented technology
Our RabMAb® technology is a patented hybridoma-based technology for making rabbit monoclonal antibodies. For details on our patents, please refer to RabMAb® patents.

What are the advantages of a recombinant monoclonal antibody?
This product is a recombinant monoclonal antibody, which offers several advantages including:

- High batch-to-batch consistency and reproducibility
- Improved sensitivity and specificity
- Long-term security of supply
- Animal-free batch production

For more information, read more on recombinant antibodies.

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	P38 alpha also known as MAPK14 is a significant member of the MAP kinase family involved in cellular response to stress signals. This protein has a molecular mass of about 38 kDa and is expressed in various tissues throughout the body. p38 alpha plays an important role in the signal transduction pathways that regulate inflammatory responses and cell differentiation. Its activity is modulated by multiple upstream kinases leading to cell-specific effects that are important for organismal homeostasis.
Biological function summary	P38 alpha MAPK14 is a part of a larger mitogen-activated protein kinase (MAPK) complex where it serves to mediate signals from external stressors to the appropriate cellular processes. It is particularly active in its roles involving inflammation and apoptosis regulation. The protein interacts with other members of the MAPK family and additional proteins such as TAB1 to conduct these biological signals efficiently.
Pathways	P38 alpha integrates into the p38 MAPK pathway and the NF-kB signaling pathway which are essential for managing cellular stress responses and inflammatory

reactions. It closely interacts with other proteins like MKK3 and MKK6 which are directly upstream regulators phosphorylating and activating p38 MAPK14. This intricate connection allows p38 alpha to execute precise regulation within cellular environments.

Associated diseases and disorders

P38 alpha MAPK14 is prominently associated with inflammatory diseases such as rheumatoid arthritis and cardiovascular disorders. In these conditions its aberrant activation or expression can lead to pathological inflammation and tissue damage. Additionally p38 alpha's connection with TNF-alpha in inflammation highlights its relevance in therapeutic targets for related disorders reflecting the significance of its modulation to potentially mitigate disease progression.

Product promise

Tested

We have tested this species and application combination and it works. It is covered by our product promise.

Expected

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

Predicted

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

Not recommended

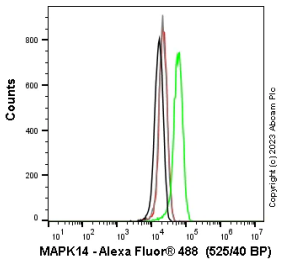
We do not recommend this combination. It is not covered by our product promise.

We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

11 product images



Flow Cytometry (Intracellular) - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

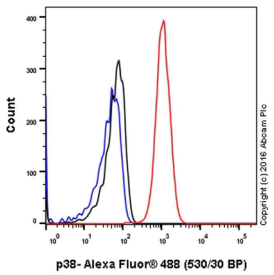
P38 alpha/MAPK14 Flow Cytometry (Intracellular) staining using rabbit Anti-p38 alpha/MAPK14 antibody

Flow cytometry overlay histogram showing wild-type Hap1 (green line) and MAPK14 knockout Hap1 stained with ab182453 (red line). The cells were fixed with 4% formaldehyde (10 min) and then permeabilised with 0.1% PBS-Triton X-100 for 15 min. The cells were then incubated in 1x PBS containing 10% normal goat serum to block non-specific protein-protein interaction followed by the antibody (ab182453) (1x 106 in 100µl at 0.2 µg/ml (1/11300)) for 30min at 22°C.

The secondary antibody Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed was incubated at 1/4000 for 30min at 22°C

Isotype control antibody Recombinant Rabbit IgG, monoclonal [EPR25A] - Isotype Control was used at the same concentration and conditions as the primary antibody (wild-type Hap1 - black line, MAPK14 knockout Hap1 - grey line). Unlabelled sample was also used as a control (this line is not shown for the purpose of simplicity).

Acquisition of >5000 events were collected using a 50 mW Blue laser (488nm) and 525/40 bandpass filter.

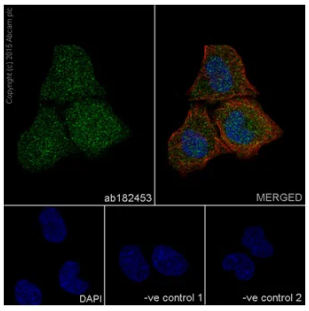


Flow Cytometry (Intracellular) - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

P38 alpha/MAPK14 Flow Cytometry (Intracellular) staining using rabbit Anti-p38 alpha/MAPK14 antibody

ab182453 staining p38in the human cell line Jurkat (human acute T cell leukemia) by intracellular flow cytometry. Cells were fixed with 4% paraformaldehyde and the sample was incubated with the primary antibody at a dilution of 1/180. A goat anti rabbit IgG (Alexa Fluor® 488) at a dilution of 1/2000 was used as the secondary antibody.
Isoytype control: Rabbit monoclonal IgG (Black)

Unlabelled control: Cell without incubation with primary antibody and secondary antibody (Blue)

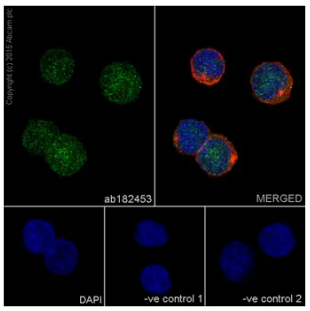


Immunocytochemistry/ Immunofluorescence - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

P38 alpha/MAPK14 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-p38 alpha/MAPK14 antibody

Immunofluorescent analysis of 4% paraformaldehyde-fixed, 0.1% Triton X-100 permeabilized HeLa (Human epithelial cells from cervix adenocarcinoma) cells labeling p38 with ab182453 at 1/500 dilution, followed by Goat anti-rabbit IgG (Alexa Fluor® 488) (ab150077) secondary antibody at 1/500 dilution (green).
Confocal image showing cytoplasm and nucleus staining on HeLa cell line.

The nuclear counter stain is DAPI (blue). Tubulin is detected with ab7291 (anti-Tubulin mouse mAb) at 1/1000 dilution and ab150120 (AlexaFluor®594 Goat anti-Mouse secondary) at 1/500 dilution (red).
The negative controls are as follows:
1. ab182453 at 1/500 dilution followed by ab150120 (AlexaFluor®594 Goat anti-Mouse secondary) at 1/500 dilution.
2. ab7291 (anti-Tubulin mouse mAb) at 1/1000 dilution followed by ab150077 (Alexa Fluor®488 Goat Anti-Rabbit IgG H&L) at 1/500 dilution.

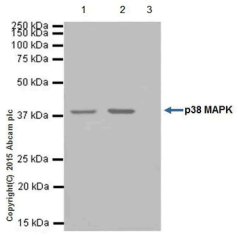


Immunocytochemistry/ Immunofluorescence - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

P38 alpha/MAPK14 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-p38 alpha/MAPK14 antibody

Immunofluorescent analysis of 4% paraformaldehyde-fixed, 0.1% Triton X-100 permeabilized Jurkat (Human T cell leukemia cells from peripheral blood) cells labeling p38 with ab182453 at 1/500 dilution, followed by Goat anti-rabbit IgG (Alexa Fluor® 488) (ab150077) secondary antibody at 1/500 dilution (green).
Confocal image showing cytoplasm and nucleus staining on Jurkat cell line.

The nuclear counter stain is DAPI (blue). Tubulin is detected with ab7291 (anti-Tubulin mouse mAb) at 1/1000 dilution and ab150120 (AlexaFluor®594 Goat anti-Mouse secondary) at 1/500 dilution (red).
The negative controls are as follows:
1. ab182453 at 1/500 dilution followed by ab150120 (AlexaFluor®594 Goat anti-Mouse secondary) at 1/500 dilution.
2. ab7291 (anti-Tubulin mouse mAb) at 1/1000 dilution followed by ab150077 (Alexa Fluor®488 Goat Anti-Rabbit IgG H&L) at 1/500 dilution.

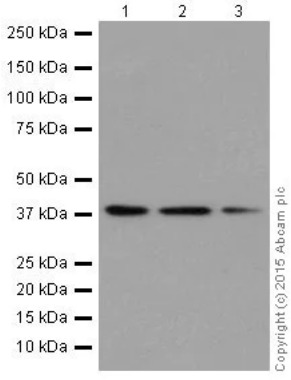


Immunoprecipitation - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

Immunoprecipitation of p38 from 1mg of Jurkat (Human T cell leukemia cells from peripheral blood) whole cell lysate achieved using ab182453 at 1/100 dilution.
Lane 1: Input: 10µg of Jurkat whole cell lysate.
Lane 2: Jurkat whole cell lysate following IP with ab182453.
Lane 3: negative control: IP using Rabbit monoclonal IgG (ab172730) instead of ab182453 in Jurkat whole cell lysate.
Western blot was performed using ab182453 at 1/1000 dilution.
An Anti-Rabbit IgG (HRP), specific to the non-reduced form of IgG at 1/1500 was used as secondary antibody.
Blocking and dilution buffer and concentration: 5% NFDM/TBST. 10 second exposure.
All lanes:
Immunoprecipitation - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

Predicted band size: 41 kDa

Observed band size: 38 kDa



Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

5% NFDM/TBST: Blocking and diluting buffer.
All lanes:
Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453) at 1/1000 dilution

Lane 1:
Human fetal heart lysate at 10 µg

Lane 2:
Human fetal kidney lysate at 10 µg

Lane 3:

Human fetal spleen lysate at 10 µg

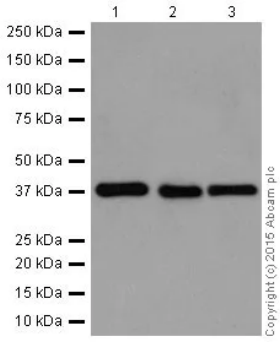
Secondary

All lanes:
Anti-Rabbit IgG (HRP), specific to the non-reduced form of IgG at 1/1000 dilution

Predicted band size: 41 kDa

Observed band size: 38 kDa

Exposure time: 3min



Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

5% NFDM/TBST: Blocking and diluting buffer.
All lanes:
Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453) at 1/1000 dilution

Lane 1:
HeLa (Human epithelial cells from cervix adenocarcinoma) whole cell lysate at 20 µg

Lane 2:
Jurkat (Human T cell leukemia cells from peripheral blood) whole cell lysate at 20 µg

Lane 3:
Neuro-2a (Mouse neuroblastoma cells) whole cell lysate at 20 µg

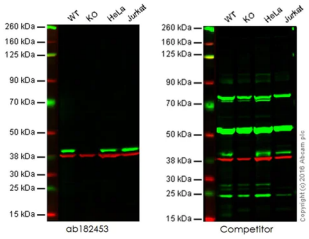
Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/1000 dilution

Predicted band size: 41 kDa

Observed band size: 38 kDa

Exposure time: 3min



Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

Lanes 1 - 4: Merged signal (red and green). Green - ab182453 observed at 40 kDa. Red - loading control, ab8245, observed at 37 kDa.
This western blot image is a comparison between ab182453 and a competitor's top cited rabbit polyclonal antibody.

All lanes:
Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

Lane 1:
Wild-type HAP1 cell lysate at 20 µg

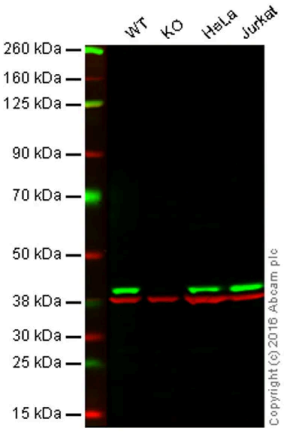
Lane 2:
p38 knockout HAP1 cell lysate at 20 µg

Lane 3:

HeLa cell lysate at 20 µg

Lane 4:
Jurkat cell lysate at 20 µg

Predicted band size: 41 kDa



Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

Lanes 1 - 4: Merged signal (red and green). Green - ab182453 observed at 40 kDa. Red - loading control, ab8245, observed at 37 kDa.
ab182453 was shown to specifically react with p38 when p38 knockout samples were used. Wild-type and p38 knockout samples were subjected to SDS-PAGE. ab182453 and ab8245 (loading control to GAPDH) were diluted 1/1000 and 1/2000 respectively and incubated overnight at 4°C. Blots were developed with Goat anti-Rabbit IgG H&L (IRDye® 800CW) preadsorbed (ab216773) and Goat anti-Mouse IgG H&L (IRDye® 680RD) preadsorbed (ab216776) secondary antibodies at 1/10 000 dilution for 1 h at room temperature before imaging.

All lanes:
Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453) at 1/1000 dilution

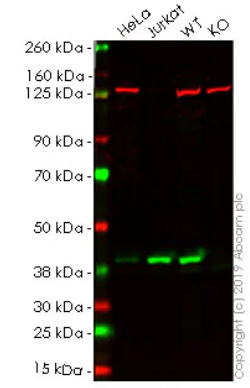
Lane 1:
Wild-type HAP1 cell lysate at 20 µg

Lane 2:
p38 knockout HAP1 cell lysate at 20 µg

Lane 3:
HeLa cell lysate at 20 µg

Lane 4:
Jurkat cell lysate at 20 µg

Predicted band size: 41 kDa



Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

P38 alpha/MAPK14 Western blot staining using rabbit Anti-p38 alpha/MAPK14 antibody

Lanes 1 - 4: Merged signal (red and green). Green - ab182453 observed at 40 kDa. Red - loading control, ab130007 observed at 125 kDa.
ab182453 was shown to react with p38 in wild-type HEK-293TT cells. Loss of signal was observed when knockout cell line ab255406 (knockout cell lysate ab263787) was used. Wild-type and p38 knockout samples were subjected to SDS-PAGE. ab182453 and Anti-Vinculin antibody [VIN-54] (ab130007) were incubated overnight at 4°C at 1 in 1000 dilution and 1 in 20000 dilution respectively. Blots were developed with Goat anti-Rabbit IgG H&L (IRDye® 800CW) preadsorbed (ab216773) and Goat anti-Mouse IgG H&L (IRDye® 680RD) preadsorbed (ab216776) secondary antibodies at 1 in 20000 dilution for 1 hour at room temperature before imaging.

All lanes:
Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453) at 1/1000 dilution

Lane 1:
HeLa cell lysate at 20 µg

Lane 2:
Jurkat cell lysate at 20 µg

Lane 2:
Western blot - Human MAPK14 (p38) knockout HEK-293T cell line (ab255406)

Lane 3:
Wild-type HEK-293T cell lysate at 20 µg

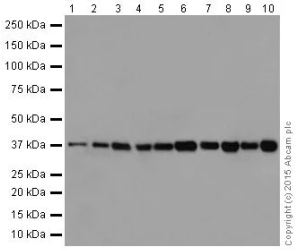
Lane 4:
MAPK14 knockout HEK-293T cell lysate at 20 µg

Secondary

All lanes:
Western blot - Goat anti-Rabbit IgG H&L (IRDye® 800CW) preadsorbed (ab216773) at 1/20000 dilution

Predicted band size: 41 kDa

Observed band size: 124 kDa, 38 kDa



Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453)

P38 alpha/MAPK14 Western blot staining using rabbit Anti-p38 alpha/MAPK14 antibody

5% NFDM/TBST: Blocking and diluting buffer.
All lanes:
Western blot - Anti-p38 alpha/MAPK14 antibody [EPR16878] (ab182453) at 1/1000 dilution

Lane 1:
Mouse heart lysate at 10 µg

Lane 2:
Mouse kidney lysate at 10 µg

Lane 3:
Mouse spleen lysate at 10 µg

Lane 4:
Rat heart lysate at 10 µg

Lane 5:
Rat kidney lysate at 10 µg

Lane 6:
Rat spleen lysate at 10 µg

Lane 7:
C6 (Rat glial tumor cells) whole cell lysate at 10 µg

Lane 8:
RAW 264.7(Mouse macrophage cells transformed with Abelson murine leukemia virus) whole cell lysate at 10 µg

Lane 9:
PC12 (Rat adrenal gland pheochromocytoma) whole cell lysate at 10 µg

Lane 10:
NIH 3T3 (Mouse embyro fibroblast cells) whole cell lysate at 10 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/1000 dilution

Predicted band size: 41 kDa

Observed band size: 38 kDa

Exposure time: 30s

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.