abcam

ab109282

Anti-ERK1 antibody [EP4967]

Lab Essentials | Recombinant | RabMAb | KO Validated | 20ul selling size

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	pH: 7.2 - 7.4 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	EP4967
Purification technique	Affinity purification Protein A
Concentration	0.349 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IHC-P

Tested

Species	Human
Dilution info	1/100 - 1/250
Notes	Heat up to 98°C, below boiling, and then let cool for 10-20 min. Perform heat-mediated antigen retrieval via the pressure cooker method before commencing with IHC staining protocol.

Expected

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

WB

Tested

Species	Mouse
Dilution info	1/1000 - 1/10000
Notes	-

Species	Rat
Dilution info	1/1000 - 1/10000
Notes	-

Species	Human
Dilution info	1/1000 - 1/10000
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/100
Notes	-

Expected

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

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/30
Notes	ab172730-Rabbit monoclonal IgG, is suitable for use as an isotype control with this antibody.

Expected

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

IP

Tested

Species	Human, Mouse
Dilution info	-
Notes	-

Expected

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

Target data

See full target information MAPK3

Function Serine/threonine kinase which acts as an essential component of the MAP kinase signal transduction pathway (PubMed:34497368). MAPK1/ERK2 and MAPK3/ERK1 are the 2 MAPKs which play an important role in the MAPK/ERK cascade. They participate also in a signaling cascade initiated by activated KIT and KITLG/SCF. Depending on the cellular context, the MAPK/ERK cascade mediates diverse biological functions such as cell growth, adhesion, survival and differentiation

through the regulation of transcription, translation, cytoskeletal rearrangements. The MAPK/ERK cascade also plays a role in initiation and regulation of meiosis, mitosis, and postmitotic functions in differentiated cells by phosphorylating a number of transcription factors. About 160 substrates have already been discovered for ERKs. Many of these substrates are localized in the nucleus, and seem to participate in the regulation of transcription upon stimulation. However, other substrates are found in the cytosol as well as in other cellular organelles, and those are responsible for processes such as translation, mitosis and apoptosis. Moreover, the MAPK/ERK cascade is also involved in the regulation of the endosomal dynamics, including lysosome processing and endosome cycling through the perinuclear recycling compartment (PNRC); as well as in the fragmentation of the Golgi apparatus during mitosis. The substrates include transcription factors (such as ATF2, BCL6, ELK1, ERF, FOS, HSF4 or SPZ1), cytoskeletal elements (such as CANX, CTTN, GJA1, MAP2, MAPT, PXN, SORBS3 or STMN1), regulators of apoptosis (such as BAD, BTG2, CASP9, DAPK1, IER3, MCL1 or PPARG), regulators of translation (such as EIF4EBP1) and a variety of other signaling-related molecules (like ARHGEF2, DEPTOR, FRS2 or GRB10) (PubMed:35216969). Protein kinases (such as RAF1, RPS6KA1/RSK1, RPS6KA3/RSK2, RPS6KA2/RSK3, RPS6KA6/RSK4, SYK, MKNK1/MNK1, MKNK2/MNK2, RPS6KA5/MSK1, RPS6KA4/MSK2, MAPKAPK3 or MAPKAPK5) and phosphatases (such as DUSP1, DUSP4, DUSP6 or DUSP16) are other substrates which enable the propagation the MAPK/ERK signal to additional cytosolic and nuclear targets, thereby extending the specificity of the cascade. Phosphorylates GJA1 at 'Ser-279' and 'Ser-282' resulting in an increase in GJA1 ubiquitination and ultimately lysosomal degradation (By similarity).

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	ERK1 also known as MAPK3 is an extracellular signal-regulated kinase involved in transmitting signals from the cell surface to the nucleus. This protein has a molecular mass of about 44 kDa. ERK1 expresses in various tissue types with higher expression in the brain heart and skeletal muscle. Researchers often study ERK1 in the context of its role in cellular signaling due to its involvement in critical regulatory functions.
Biological function summary	ERK1 plays a significant role in cell cycle regulation differentiation and proliferation. It forms part of the MAPK signaling cascade becoming activated through a phosphorylation event. In its activated form ERK1 translocates to the nucleus where it phosphorylates target substrates. ERK1 often functions in conjunction with its homolog ERK2 to mediate these cellular processes marking it as an essential player in growth factor signaling.
Pathways	ERK1 functions primarily within the MAPK/ERK signaling pathway a major conduit for transmitting proliferative signals from growth factor receptors. ERK1 interacts with proteins like MEK1/2 which phosphorylate and activate ERK1 in response to extracellular stimuli. Another critical pathway involving ERK1 is the Ras-Raf-MEK-ERK cascade which regulates various cellular outcomes. This connection to the Ras family highlights its importance in signal transduction and reinforces its position in critical cellular processes.
Associated diseases and disorders	Aberrant activation of ERK1 connects to diseases such as cancer and cardiovascular disorders. In cancer the dysregulation of the MAPK/ERK pathway often through mutations affecting Ras or Raf proteins leads to uncontrolled cell proliferation. ERK1's involvement in cardiovascular diseases links to its role in hypertrophic signaling in cardiac cells where altered ERK1 activity can contribute to pathological cardiac remodeling. Understanding these interactions can aid in developing therapeutic strategies targeting the MAPK/ERK signaling pathway.

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.

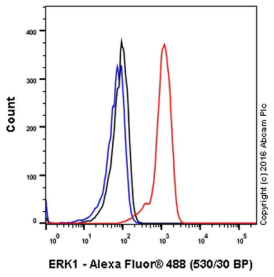
We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

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.

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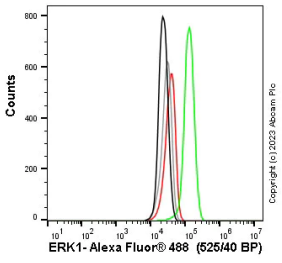
13 product images



Flow Cytometry (Intracellular) - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Flow Cytometry (Intracellular) staining using rabbit Anti-ERK1 antibody

Intracellular Flow Cytometry analysis of Jurkat (human acute T cell leukemia) cells labeling ERK1 with purified ab109282 at 1/30 dilution (red). The secondary antibody was Goat anti rabbit IgG (Alexa Fluorr® 488) at 1/2000 dilution. A Rabbit monoclonal IgG (Black) was used as the isotype control and cells without incubation with primary antibody and secondary antibody (Blue) were used as unlabeled control.



Flow Cytometry (Intracellular) - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Flow Cytometry (Intracellular) staining using rabbit Anti-ERK1 antibody

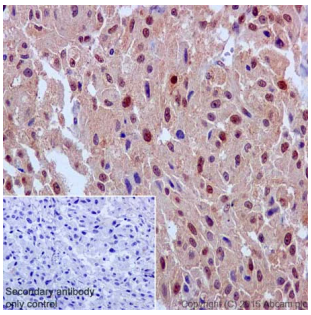
Flow cytometry overlay histogram showing wild-type Hap1 (green line) and MAPK3 knockout Hap1 stained with ab109282 (red line). The cells were fixed with 4% formaldehyde (10 min) and then permeabilised with 0.1% PBS-Triton X-100 for 15 min. The cells were then incubated in 1x PBS containing 10% normal goat serum to block non-specific protein-protein interaction followed by the antibody (ab109282) (1x 106 in 100µl at 0.2 µg/ml (1/11400)) 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, MAPK3 knockout Hap1 - grey line). Unlabelled sample was also used as a control (this line is not shown for the purpose of simplicity).

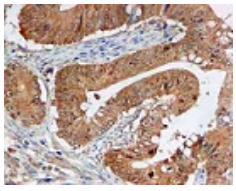
Acquisition of >5000 events were collected using a 50 mW Blue laser (488nm) and 525/40 bandpass filter.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-ERK1 antibody

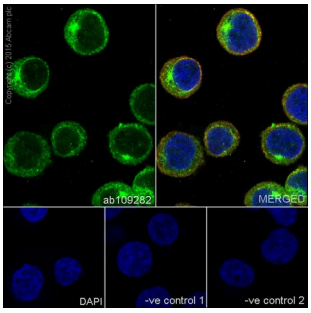
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of human melanoma tissue labelling ERK1 with purified ab109282 at 1/100. Heat mediated antigen retrieval was performed using Tris/EDTA buffer pH 9. ab97051, a goat anti-rabbit IgG H&L (HRP) was used as the secondary antibody (1/500). Negative control using PBS instead of primary antibody. Counterstained with hematoxylin.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-ERK1 antibody

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of Human colonic adenocarcinoma tissue labelling ERK1 with unpurified ab109282 at 1/100 dilution. Perform heat mediated antigen retrieval via the pressure cooker method before commencing with IHC staining protocol.

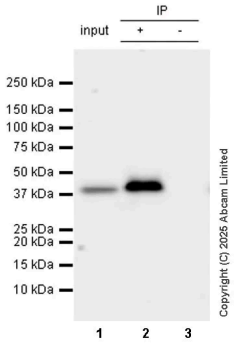


Immunocytochemistry/ Immunofluorescence - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-ERK1 antibody

Immunocytochemistry/Immunofluorescence analysis of Jurkat (human acute T cell leukemia) cells labelling ERK1 with purified ab109282 at 1/100. Cells were fixed with 4% paraformaldehyde and permeabilized with 0.1% Triton X-100. ab150077, an Alexa Fluor® 488-conjugated goat anti-rabbit IgG (1/500) was used as the secondary antibody. DAPI (blue) was used as the nuclear counterstain. ab7291, a mouse anti-tubulin (1/1000) and ab150120, an Alexa Fluor® 594-conjugated goat anti-mouse IgG (1/1000) were also used.
Control 1: primary antibody (1/100) and secondary antibody, ab150120, an Alexa Fluor® 594-conjugated goat anti-mouse IgG (1/500).

Control 2: ab7291 (1/1000) and secondary antibody, ab150077, an Alexa Fluor® 488-conjugated goat anti-rabbit IgG (1/500).



Immunoprecipitation - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 was immunoprecipitated from Jurkat (human T cell leukemia T lymphocyte from peripheral blood) whole cell lysate with ab109282 at 1/50 dilution (2µg in 0.35mg lysates). Western blot was performed on the immunoprecipitate using ab109282 at 1/1000 dilution.

Blocking and dilution buffer and concentration: 5% NFDM/TBST.

All lanes:
Immunoprecipitation - Anti-ERK1 antibody [EP4967] (ab109282) at 1/1000 dilution

Lane 1:
Jurkat (human T cell leukemia T lymphocyte from peripheral blood) whole cell lysate (Input) at 10 µg

Lane 2:
Jurkat (human T cell leukemia T lymphocyte from peripheral blood) whole cell lysate (+)

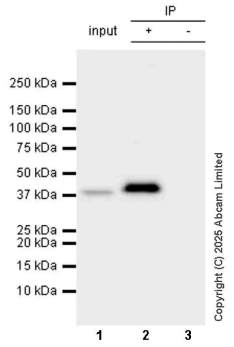
Lane 3:
Rabbit monoclonal IgG (ab172730) instead of ab109282 in Jurkat whole cell lysate (-)

Secondary

All lanes:
Immunoprecipitation - VeriBlot for IP Detection Reagent (HRP) (ab131366) at 1/5000 dilution

Observed band size: 44 kDa

Exposure time: 15s



Immunoprecipitation - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 was immunoprecipitated from NIH/3T3 (mouse embryonic fibroblast) whole cell lysate with ab109282 at 1/50 dilution (2µg in 0.35mg lysates). Western blot was performed on the immunoprecipitate using ab109282 at 1/1000 dilution.

Blocking and dilution buffer and concentration: 5% NFDM/TBST.

All lanes:
Immunoprecipitation - Anti-ERK1 antibody [EP4967] (ab109282) at 1/1000 dilution

Lane 1:
NIH/3T3 (mouse embryonic fibroblast) whole cell lysate at 10 µg

Lane 2:
NIH/3T3 (mouse embryonic fibroblast) whole cell lysate

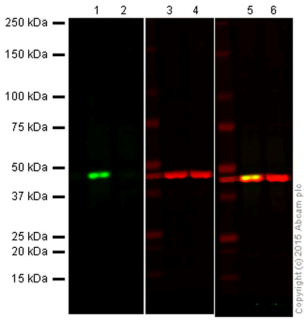
Lane 3:
Rabbit monoclonal IgG (ab172730) instead of ab109282 in NIH/3T3 whole cell lysate (-)

Secondary

All lanes:
Immunoprecipitation - VeriBlot for IP Detection Reagent (HRP) (ab131366) at 1/5000 dilution

Observed band size: 44 kDa

Exposure time: 15s

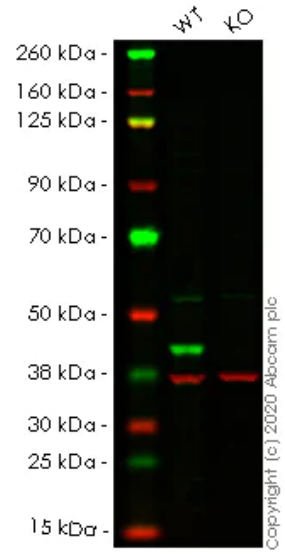


Western blot - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Western blot staining using rabbit Anti-ERK1 antibody

Lanes 1, 3 and 5: Wild-type HAP1 cell lysate (20 µg)
Lanes 2, 4 and 6: ERK1 knockout HAP1 cell lysate (20 µg)
Lanes 1 and 2: Green signal from target - ab109282 observed at 42 kDa
Lanes 3 and 4: Red signal from loading control - ab8226 observed at 42 kDa
Lanes 5 and 6: Merged (red and green) signal
ab109282 was shown to specifically react with ERK1 when ERK1 knockout samples were used. Wild-type and ERK1 knockout samples were subjected to SDS-PAGE. ab109282 and ab8226 (loading control to beta actin) were both diluted 1/1000 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 1/10000 dilution for 1 h at room temperature before imaging.
All lanes:
Western blot - Anti-ERK1 antibody [EP4967] (ab109282)

Predicted band size: 43 kDa



Western blot - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Western blot staining using rabbit Anti-ERK1 antibody

Lanes 1- 2: Merged signal (red and green). Green - ab109282 observed at 43 kDa. Red - Anti-GAPDH antibody [6C5] - Loading Control (ab8245) observed at 37 kDa.
ab109282 was shown to react with ERK1 in wild-type HEK-293T cells in western blot. Loss of signal was observed when knockout cell line ab266519 (knockout cell lysate ab257099) was used. Wild-type HEK-293T and MAPK3 knockout HEK-293T cell lysates were subjected to SDS-PAGE. Membrane was blocked for 1 hour at room temperature in 0.1% TBST with 3% non-fat dried milk. ab109282 and Anti-GAPDH antibody [6C5] - Loading Control (ab8245) overnight at 4°C at a 1 in 1000 dilution and a 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-ERK1 antibody [EP4967] (ab109282) at 1/1000 dilution

Lane 1:
Wild-type HEK-293T cell lysate at 20 µg

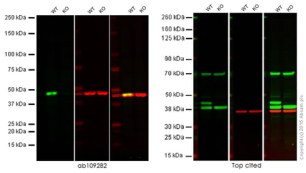
Lane 2:
MAPK3 knockout HEK-293T cell lysate at 20 µg

Lane 2:
Western blot - Human MAPK3 (ERK1) knockout HEK-293T cell line (ab266519)

Performed under reducing conditions.

Predicted band size: 43 kDa

Observed band size: 43 kDa



Western blot - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Western blot staining using rabbit Anti-ERK1 antibody

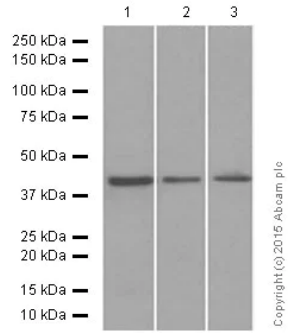
Predicted band size : 43 kDa
Lanes 1, 3 and 5: Wild-type HAP1 cell lysate (20 µg)
Lanes 2, 4 and 6: ERK1 knockout HAP1 cell lysate (20 µg)
Lanes 1 and 2: Green signal from target
Lanes 3 and 4: Red signal from loading control
Lanes 5 and 6: Merged (red and green) signal

Red - loading control, ab8226 observed at 42 kDa or ab8245, observed at 37 kDa

This western blot image is a comparison between ab109282 and a competitor's top cited rabbit polyclonal antibody.

All lanes:
Western blot - Anti-ERK1 antibody [EP4967] (ab109282)

Predicted band size: 43 kDa



Western blot - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Western blot staining using rabbit Anti-ERK1 antibody

Blocking buffer and concentration: 5% NFDM/TBST.
Diluting buffer and concentration: 5% NFDM /TBST.

All lanes:
Western blot - Anti-ERK1 antibody [EP4967] (ab109282) at 1/10000 dilution

Lane 1:
Jurkat cell lysate at 20 µg

Lane 2:
A375 cell lysate at 20 µg

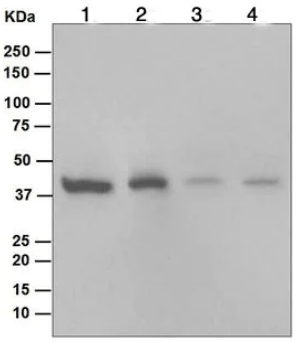
Lane 3:
HUVEC cell lysate at 20 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/10000 dilution

Predicted band size: 114 kDa, 15 kDa, 18 kDa, 21 kDa, 34 kDa, 43 kDa, 55 kDa, 68 kDa, 83 kDa

Observed band size: 15 kDa, 21 kDa, 23 kDa, 90 kDa



Western blot - Anti-ERK1 antibody [EP4967] (ab109282)

All lanes:
Western blot - Anti-ERK1 antibody [EP4967] (ab109282) at 1/1000 dilution

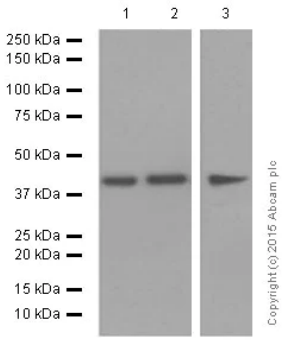
Lane 1:
Jurkat cell lysate at 10 µg

Lane 2:
A375 cell lysate at 10 µg

Lane 3:
A431 cell lysate at 10 µg

Lane 4:
HUVEC cell lysate at 10 µg

Predicted band size: 43 kDa



Western blot - Anti-ERK1 antibody [EP4967] (ab109282)

ERK1 Western blot staining using rabbit Anti-ERK1 antibody

Blocking buffer and concentration: 5% NFDM/TBST.
Diluting buffer and concentration: 5% NFDM /TBST.

All lanes:
Western blot - Anti-ERK1 antibody [EP4967] (ab109282) at 1/10000 dilution

Lane 1:
Mouse brain lysate at 20 µg

Lane 2:
Rat brain lysate at 20 µg

Lane 3:
NIH/3T3 cell lysate at 20 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/10000 dilution

Predicted band size: 43 kDa

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