abcam

ab174854

Anti-WNK1 antibody [EPR2743(3)]

Recombinant | RabMAb | KO Validated

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	EPR2743(3)
Purification technique	Affinity purification Protein A
Concentration	1.817 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IP

Not recommended

Species	Mouse, Rat, Human
Dilution info	-
Notes	-

WB

Tested

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

Not recommended

Species	Mouse, Rat
Dilution info	-
Notes	-

IHC-P

Not recommended

Species	Mouse, Rat, Human
Dilution info	-
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/100 - 1/250
Notes	-

Not recommended

Species	Mouse, Rat
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/100 - 1/500
Notes	ab172730 - Rabbit monoclonal IgG, is suitable for use as an isotype control with this antibody.

Not recommended

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

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

Target data

See full target information WNK1

Function

Serine/threonine-protein kinase component of the WNK1-SPAK/OSR1 kinase cascade, which acts as a key regulator of blood pressure and regulatory volume increase by promoting ion influx (PubMed:15883153, PubMed:17190791, PubMed:31656913, PubMed:34289367, PubMed:36318922). WNK1 mediates regulatory volume increase in response to hyperosmotic stress by acting as a molecular crowding sensor, which senses cell shrinkage and mediates formation of a membraneless compartment by undergoing liquid-liquid phase separation (PubMed:36318922). The membraneless compartment concentrates WNK1 with its substrates, OXSR1/OSR1 and STK39/SPAK, promoting WNK1-dependent phosphorylation and activation of downstream kinases OXSR1/OSR1 and STK39/SPAK (PubMed:15883153, PubMed:16263722, PubMed:17190791, PubMed:19739668, PubMed:21321328, PubMed:22989884, PubMed:25477473, PubMed:34289367, PubMed:36318922). Following activation, OXSR1/OSR1 and STK39/SPAK catalyze phosphorylation of ion cotransporters SLC12A1/NKCC2, SLC12A2/NKCC1, SLC12A5/KCC2 and SLC12A6/KCC3, regulating their activity (PubMed:16263722, PubMed:21321328). Phosphorylation of Na-K-Cl cotransporters SLC12A2/NKCC1 and SLC12A2/NKCC1 promote their activation and ion influx; simultaneously, phosphorylation of K-Cl cotransporters SLC12A5/KCC2 and SLC12A6/KCC3 inhibit their activity, blocking ion efflux (PubMed:19665974, PubMed:21321328). Also acts as a regulator of angiogenesis in endothelial cells via activation of OXSR1/OSR1 and STK39/SPAK: activation of OXSR1/OSR1 regulates chemotaxis and invasion, while STK39/SPAK regulates endothelial cell proliferation (PubMed:25362046). Also acts independently of the WNK1-SPAK/OSR1 kinase

cascade by catalyzing phosphorylation of other substrates, such as SYT2, PCF11 and NEDD4L (PubMed:29196535). Mediates phosphorylation of SYT2, regulating SYT2 association with phospholipids and membrane-binding (By similarity). Regulates mRNA export in the nucleus by mediating phosphorylation of PCF11, thereby decreasing the association between PCF11 and POLR2A/RNA polymerase II and promoting mRNA export to the cytoplasm (PubMed:29196535). Acts as a negative regulator of autophagy (PubMed:27911840). Required for the abscission step during mitosis, independently of the WNK1-SPAK/OSR1 kinase cascade (PubMed:21220314). May also play a role in actin cytoskeletal reorganization (PubMed:10660600). Also acts as a scaffold protein independently of its protein kinase activity: negatively regulates cell membrane localization of various transporters and channels, such as SLC4A4, SLC26A6, SLC26A9, TRPV4 and CFTR (By similarity). Involved in the regulation of epithelial Na(+) channel (ENaC) by promoting activation of SGK1 in a kinase-independent manner: probably acts as a scaffold protein that promotes the recruitment of SGK1 to the mTORC2 complex in response to chloride, leading to mTORC2-dependent phosphorylation and activation of SGK1 (PubMed:36373794). Acts as an assembly factor for the ER membrane protein complex independently of its protein kinase activity: associates with EMC2 in the cytoplasm via its amphipathic alpha-helix, and prevents EMC2 ubiquitination and subsequent degradation, thereby promoting EMC2 stabilization (PubMed:33964204). Isoform 3. Kinase-defective isoform specifically expressed in kidney, which acts as a dominant-negative regulator of the longer isoform 1 (PubMed:14645531). Does not directly inhibit WNK4 and has no direct effect on sodium and chloride ion transport (By similarity). Down-regulates sodium-chloride cotransporter activity indirectly by inhibiting isoform 1, it associates with isoform 1 and attenuates its kinase activity (By similarity). In kidney, may play an important role regulating sodium and potassium balance (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

This antibody was developed as part of a collaboration between Epitomics and the lab of Melanie Cobb at UT Southwestern Medical Center.

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	WNK1 also known as With No Lysine 1 is a protein kinase with a molecular mass of approximately 251 kDa. Mechanically WNK1 functions as a serine/threonine kinase influencing the phosphorylation status of various substrates involved in ionic balance and cell volume regulation. It plays an important role in controlling ion transport channels. The protein is expressed in multiple tissues with high levels in the kidney and lower levels in the brain heart and other regions of the body. Its activity is especially important in the distal nephrons of the kidney.
Biological function summary	WNK1 affects sodium and potassium ion transport which is essential for maintaining homeostasis. It is a part of a larger signaling complex where it modulates the activity of SPAK and OSR1 kinases which directly affect ion transporters like NKCCs and NCC. By regulating these kinases WNK1 contributes to maintaining the balance of electrolytes influencing blood pressure and general cellular osmoregulation.
Pathways	WNK1 significantly impacts the WNK-SPAK/OSR1 signaling pathway which has direct roles in sodium and potassium ion transport. The pathway associates closely with proteins like SPAK and OSR1 which WNK1 activates affecting the function of ion transporters and channels. This signaling mechanism plays an integral role in renal salt reabsorption and is important for controlling systemic blood pressure.
Associated diseases and disorders	Mutations and dysregulation of WNK1 link to hereditary hypertension and pseudohypoaldosteronism type II (PHAII) also known as Gordon's syndrome. These conditions involve elevated blood pressure and electrolyte imbalance due to altered transport activity. A change in WNK1 function can disrupt normal interaction with other proteins in its pathway such as NCC leading to these disorders. Understanding WNK1's role offers potential therapeutic targets for managing conditions related to electrolyte imbalance and blood pressure regulation.

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

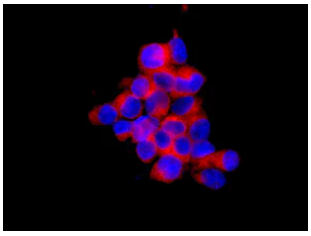
We do not recommend this combination. It is not covered by our product promise.

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.

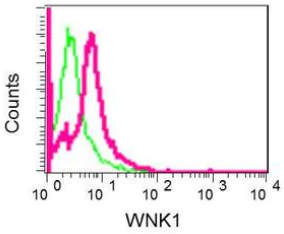
4 product images



Immunocytochemistry/ Immunofluorescence - Anti-WNK1 antibody [EPR2743(3)] (ab174854)

WNK1 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-WNK1 antibody

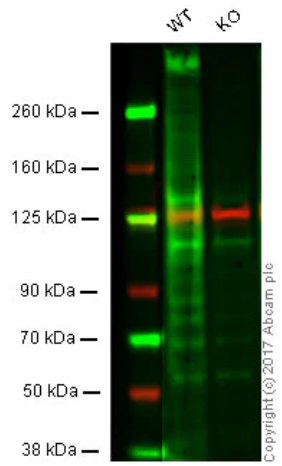
Immunofluorescent analysis of 293T cells labeling WNK1 with ab174854 at 1/100 dilution (red). Nuclear DAPI staining (blue).



Flow Cytometry (Intracellular) - Anti-WNK1 antibody [EPR2743(3)] (ab174854)

WNK1 Flow Cytometry (Intracellular) staining using rabbit Anti-WNK1 antibody

Intracellular flow cytometric analysis of permeabilized 293T cells labeling WNK1 with ab174854 at 1/10 dilution (red), or a rabbit IgG (negative) (green).



Western blot - Anti-WNK1 antibody [EPR2743(3)] (ab174854)

WNK1 Western blot staining using rabbit Anti-WNK1 antibody

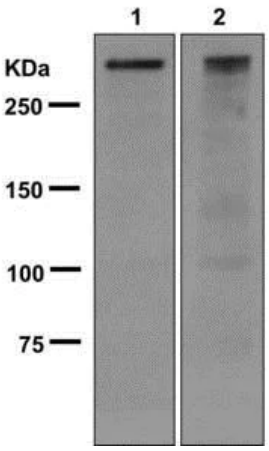
Lane 1: Wild type HAP1 whole cell lysate (40 µg)
Lane 2: WNK1 knockout HAP1 whole cell lysate (40 µg)
Lanes 1 - 2: Merged signal (red and green). Green - ab174854 observed at 300 kDa. Red - loading control, ab18058, observed at 130 kDa.

ab174854 was shown to recognize WNK1 when WNK1 knockout samples were used, along with additional cross-reactive bands. Wild-type and WNK1 knockout samples were subjected to SDS-PAGE. ab174854 and ab18058 (Mouse anti Vinculin loading control) were incubated overnight at 4°C at 1000 dilution and 1/10000 dilution respectively. Blots were developed with Goat anti-Rabbit IgG H&L (IRDye® 800CW) preabsorbed ab216773 and Goat anti-Mouse IgG H&L (IRDye® 680RD) preabsorbed ab216776 secondary antibodies at 1/10000 dilution for 1 hour at room temperature before imaging.

All lanes:
Western blot - Anti-WNK1 antibody [EPR2743(3)] (ab174854)

Predicted band size: 250 kDa

Observed band size: 300 kDa



Western blot - Anti-WNK1 antibody [EPR2743(3)] (ab174854)

All lanes:
Western blot - Anti-WNK1 antibody [EPR2743(3)] (ab174854) at 1/1000 dilution

Lane 1:
293T cell lysate at 10 µg

Lane 2:
Human fetal brain cell lysate at 10 µg

Secondary

All lanes:
Goat anti-rabbit HRP at 1/2000 dilution

Predicted band size: 250 kDa

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