abcam

ab109363

Anti-RENT1/hUPF1 antibody [EPR4681]

Recombinant | RabMAb | 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	EPR4681
Purification technique	Affinity purification Protein A
Concentration	0.531 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	-

Not recommended

Species	Mouse
Dilution info	-
Notes	-

IP

Tested

Species	Human
Dilution info	1/10 - 1/100
Notes	-

Expected

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

WB

Tested

Species	Human
Dilution info	1/10000 - 1/50000
Notes	-

Species	Mouse
Dilution info	1/10000 - 1/50000
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/500

Notes	**For unpurified use at 1/100 - 1/250.**

Expected

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

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/10 - 1/100
Notes	ab172730 - Rabbit monoclonal IgG, is suitable for use as an isotype control with this antibody.

Expected

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

Target data

See full target information UPF1

Function	RNA-dependent helicase required for nonsense-mediated decay (NMD) of aberrant mRNAs containing premature stop codons and modulates the expression level of normal mRNAs (PubMed:11163187, PubMed:16086026, PubMed:18172165, PubMed:21145460, PubMed:21419344, PubMed:24726324). Is recruited to mRNAs upon translation termination and undergoes a cycle of phosphorylation and dephosphorylation; its phosphorylation appears to be a key step in NMD (PubMed:11544179, PubMed:25220460). Recruited by release factors to stalled ribosomes together with the SMG1C protein kinase complex to form the transient SURF (SMG1-UPF1-eRF1-eRF3) complex (PubMed:19417104). In EJC-dependent NMD, the SURF complex associates with the exon junction complex (EJC) (located 50-55 or more nucleotides downstream from the termination codon) through UPF2 and allows the formation of an UPF1-UPF2-UPF3 surveillance complex which is believed to activate NMD (PubMed:21419344). Phosphorylated UPF1 is recognized by EST1B/SMG5, SMG6 and SMG7 which are thought to provide a link to the mRNA degradation machinery involving exonucleolytic and endonucleolytic pathways,

and to serve as adapters to protein phosphatase 2A (PP2A), thereby triggering UPF1 dephosphorylation and allowing the recycling of NMD factors (PubMed:12554878). UPF1 can also activate NMD without UPF2 or UPF3, and in the absence of the NMD-enhancing downstream EJC indicative for alternative NMD pathways (PubMed:18447585). Plays a role in replication-dependent histone mRNA degradation at the end of phase S; the function is independent of UPF2 (PubMed:16086026, PubMed:18172165). For the recognition of premature termination codons (PTC) and initiation of NMD a competitive interaction between UPF1 and PABPC1 with the ribosome-bound release factors is proposed (PubMed:18447585, PubMed:25220460). The ATPase activity of UPF1 is required for disassembly of mRNPs undergoing NMD (PubMed:21145460). Together with UPF2 and dependent on TDRD6, mediates the degradation of mRNA harboring long 3'UTR by inducing the NMD machinery (By similarity). Also capable of unwinding double-stranded DNA and translocating on single-stranded DNA (PubMed:30218034).

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	Stable for 12 months at -20°C

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.

Species reactivity
Rat: We have preliminary internal testing data to indicate this antibody may not react with this species. Please contact us for more information.

Supplementary info

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

Activity summary	RENT1/hUPF1 also known as regulator of nonsense transcripts 1 or human UPF1 is an important factor in RNA surveillance mechanisms. It is an ATP-dependent helicase with a molecular mass of approximately 130 kDa. This protein is ubiquitously expressed in various tissues highlighting its importance across different biological systems. Mechanically UPF1 plays an essential role in the nonsense-mediated mRNA decay (NMD) pathway where it interacts with other core NMD factors to identify and degrade mRNAs containing premature stop codons.
Biological function summary	RENT1/hUPF1 ensures the quality control of mRNA by facilitating the rapid degradation of defective transcripts and thereby preventing the synthesis of potentially harmful truncated proteins. As part of the NMD complex UPF1 partners with proteins like UPF2 and UPF3 to form a surveillance mechanism that maintains cellular homeostasis. The complex cooperates to distinguish transcripts that require elimination from those necessary for normal cellular function.
Pathways	RENT1/hUPF1 integrates into essential cellular pathways beyond just NMD. The protein also links to the mRNA decay and translation initiation pathways playing significant roles alongside proteins such as SMG1 and eRF1. In these pathways UPF1 regulates gene expression by modulating mRNA stability and protein synthesis ensuring that only correctly processed mRNAs translate into proteins.
Associated diseases and disorders	RENT1/hUPF1 connects to conditions like neurodevelopmental disorders and cancer. Dysregulation of UPF1 activity can lead to improper mRNA decay contributing to the accumulation of faulty transcripts which may drive disease pathogenesis. In particular UPF1 alterations are linked to the disruption of pathways involving key proteins like p53 which are critical in tumor suppression. Understanding UPF1's role in these disorders could present opportunities for therapeutic interventions.

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.

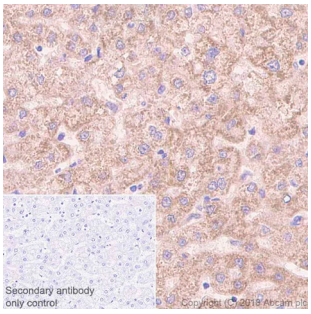
We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

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

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Terms & Conditions.

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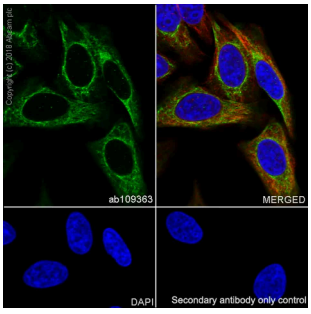
12 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-RENT1/hUPF1 antibody

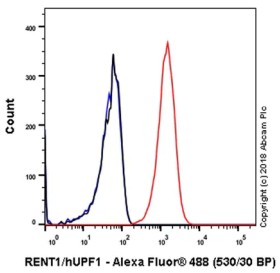
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of Human liver tissue sections labeling RENT1/hUPF1 with Purified ab109363 at 1:100 dilution (5.14 µg/ml). Heat mediated antigen retrieval was performed using ab93684 (Tris/EDTA buffer, pH 9.0). ImmunoHistoProbe one step HRP Polymer (ready to use) was used as the secondary antibody. Negative control: PBS instead of the primary antibody. Hematoxylin was used as a counterstain.



Immunocytochemistry/ Immunofluorescence - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-RENT1/hUPF1 antibody

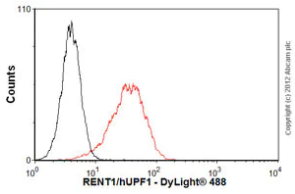
Immunocytochemistry/ Immunofluorescence analysis of HeLa (Human cervix adenocarcinoma epithelial cell) cells labeling RENT1/hUPF1 with Purified ab109363 at 1:100 dilution (5.1 µg/ml). Cells were fixed in 100% Methanol and permeabilized with None. Cells were counterstained with ab195889 Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) 1:200 (2.5 µg/ml). Goat anti rabbit IgG (Alexa Fluor® 488, ab150077) was used as the secondary antibody at 1:1000 (2 µg/ml) dilution. DAPI nuclear counterstain. PBS instead of the primary antibody was used as the secondary antibody only control.



Flow Cytometry (Intracellular) - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Flow Cytometry (Intracellular) staining using rabbit Anti-RENT1/hUPF1 antibody

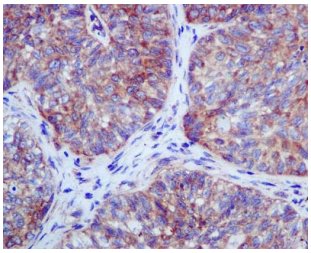
Intracellular Flow Cytometry analysis of HeLa (Human cervix adenocarcinoma epithelial cell) cells labeling RENT1/hUPF1 with Purified ab109363 at 1/50 dilution (10µg/ml) (red). Cells were fixed with 4% Paraformaldehyde. A Goat anti rabbit IgG (Alexa Fluorr® 488, ab150077) secondary antibody was used at 1/2000. Isotype control - Rabbit monoclonal IgG (Black). Unlabeled control - Cell without incubation with primary antibody and secondary antibody (Blue).



Flow Cytometry (Intracellular) - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Flow Cytometry (Intracellular) staining using rabbit Anti-RENT1/hUPF1 antibody

Overlay histogram showing HeLa cells stained with ab109363 (red line). The cells were fixed with 4% paraformaldehyde (10 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions followed by the antibody (ab109363, 1/100 dilution) for 30 min at 22°C. The secondary antibody used was DyLight® 488 goat anti-rabbit IgG (H+L) (ab96899) at 1/500 dilution for 30 min at 22°C. Isotype control antibody (black line) was rabbit IgG (monoclonal) (1µg/1x10^6 cells) used under the same conditions. Acquisition of >5,000 events was performed. This antibody gave a positive signal in HeLa cells fixed with 80% methanol (5 min)/permeabilized with 0.1% PBS-Tween for 20 min used under the same conditions.
This image was generated using the unpurified version of the product.

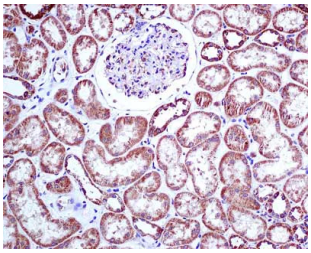


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-RENT1/hUPF1 antibody

ab109363, at 1/100, staining RENT1/hUPF1 in Human transitional cell carcinoma tissue by immunohistochemistry.
This image was generated using the unpurified version of the product.

Heat mediated antigen retrieval was performed with citrate buffer pH 6 before commencing with IHC staining protocol.

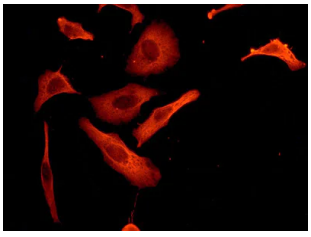


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-RENT1/hUPF1 antibody

ab109363, at 1/100, staining RENT1/hUPF1 in Human kidney tissue by immunohistochemistry.
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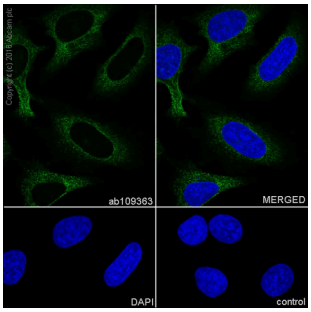
Heat mediated antigen retrieval was performed with citrate buffer pH 6 before commencing with IHC staining protocol.



Immunocytochemistry/ Immunofluorescence - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-RENT1/hUPF1 antibody

ab109363, at 1/100, staining RENT1/hUPF1 in HeLa cells by immunofluorescence.
This image was generated using the unpurified version of the product.

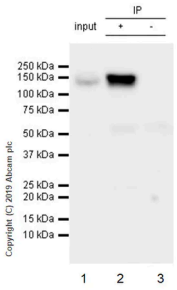


Immunocytochemistry/ Immunofluorescence - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-RENT1/hUPF1 antibody

Immunocytochemistry/Immunofluorescence analysis of HeLa (human cervix adenocarcinoma) cells labelling RENT1/hUPF1 with purified ab109363 at 1/500. Cells were fixed with 100% methanol. ab150077 Alexa Fluor® 488-conjugated goat anti-rabbit IgG (1/1000) was used as the secondary antibody. Nuclei were counterstained with DAPI (blue).
Secondary Only Control: PBS was used instead of the primary antibody as the negative control

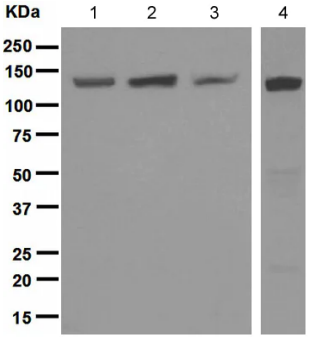
This image was generated using the unpurified version of the product.



Immunoprecipitation - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

ab109363 (purified) at 1:30 dilution (2µg) immunoprecipitating RENT1/hUPF1 in Raji whole cell lysate.
Lane 1 (input): Raji (Human Burkitt's lymphoma B lymphocyte) whole cell lysate 10µg
Lane 2 (+): ab109363 & Raji whole cell lysate
Lane 3 (-): Rabbit monoclonal IgG (ab172730) instead of ab109363 in Raji whole cell lysate
For western blotting, VeriBlot for IP Detection Reagent (HRP) (ab131366) was used for detection at 1:1000 dilution.
Blocking and diluting buffer: 5% NFDM/TBST.
All lanes:
Immunoprecipitation - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

Predicted band size: 124 kDa



Western blot - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Western blot staining using rabbit Anti-RENT1/hUPF1 antibody

This image was generated using the unpurified version of the product.
All lanes:
Western blot - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363) at 1/10000 dilution

Lane 1:
HuT-78 cell lysate at 10 µg

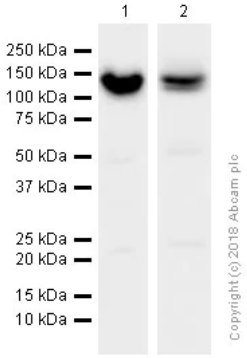
Lane 2:
Raji cell lysate at 10 µg

Lane 3:
SH-SY5Y cell lysate at 10 µg

Lane 4:
HeLa cell lysate at 10 µg

Performed under reducing conditions.

Predicted band size: 124 kDa



Western blot - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

All lanes:
Western blot - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363) at 1/10000 dilution

Lane 1:
HuT-78 (Human Sezary syndrome cutaneous T lymphocyte) whole cell lysates at 20 µg

Lane 2:
NIH/3T3 (Mouse embryonic fibroblast) whole cell lysates at 20 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/20000 dilution

Predicted band size: 124 kDa

Observed band size: 130 kDa

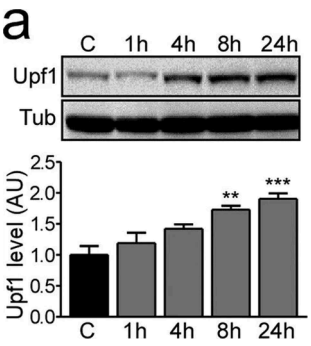


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Western blot - Anti-RENT1/hUPF1 antibody [EPR4681] (ab109363)

RENT1/hUPF1 Western blot staining using rabbit Anti-RENT1/hUPF1 antibody

RENT1/hUPF1 western blot using anti-RENT1/hUPF1 antibody [EPR4681] ab109363. Publication image and figure legend from Mooney, C. M., Jiménez-Mateos, E. M., et al., 2017, Sci Rep, PubMed 28128343.

ab109363 was used in this publication in western blot. This may not be the same as the application(s) guaranteed by Abcam. For a full list of applications guaranteed by Abcam for ab109363 please see the product overview.

NMD proteins are increased after SE in mice and Upf1 is increased in human TLE samples.(a–d) Protein levels of Upf1, phosho-Upf1 (p-Upf1), Upf2 and Upf3b in the ipsilateral hippocampus in control (C) mice and at 1, 4, 8 and 24 hours (h) after SE were analysed by western blot and semi-quantified. (a) Upf1 levels significantly increased 8 and 24 h after SE (n = 4/group; ANOVA, Dunnett's posthoc test ***p < 0.001, **p < 0.01). (b) p-Upf1 levels significantly increased 8 and 24 h after SE (n = 5/group; ANOVA, Dunnett's posthoc test *p < 0.05 compared to control. (c) Upf2 levels were increased 8 h after SE (n = 4/group; ANOVA, Dunnett's posthoc test *p < 0.05 compared to control). (d) Upf3b levels did not change after SE (n = 4/group; ANOVA, Dunnett's posthoc test p = 0.88). (e) Upf1 protein levels were significantly higher in TLE patients with hippocampal sclerosis (HS) compared to post-mortem controls and TLE patients without HS (Controls n = 6; TLE without HS n = 3, TLE with HS n = 3; ANOVA with Bonferroni post-hoc test comparing all columns; p = 0.0072). Representative blots have been cropped to reduce unnecessary area.

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