abcam

ab177478

Anti-UBA5 antibody [EPR11729]

Recombinant | RabMAb

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	EPR11729
Purification technique	Affinity purification Protein A
Concentration	0.231 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IHC-P

Tested

Species	Human
Dilution info	1/50 - 1/100
Notes	-

Not recommended

Species	Mouse, Rat
Dilution info	-
Notes	-

IP

Not recommended

Species	Mouse, Rat, Human
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	1/1000 - 1/5000
Notes	-

Not recommended

Species	Mouse, Rat
Dilution info	-
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/50 - 1/100
Notes	-

Not recommended

Species	Mouse, Rat
Dilution info	-
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.

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 UBA5

Function E1-like enzyme which specifically catalyzes the first step in ufmylation (PubMed:15071506, PubMed:18442052, PubMed:20368332, PubMed:25219498, PubMed:26929408, PubMed:27545674, PubMed:27545681, PubMed:27653677, PubMed:30412706, PubMed:30626644, PubMed:34588452). Activates UFM1 by first adenylating its C-terminal glycine residue with ATP, and thereafter linking this residue to the side chain of a cysteine residue in E1, yielding a UFM1-E1 thioester and free AMP (PubMed:20368332, PubMed:26929408, PubMed:27653677, PubMed:30412706). Activates UFM1 via a trans-binding mechanism, in which UFM1 interacts with distinct sites in both subunits of the UBA5 homodimer (PubMed:27653677). Trans-binding also promotes stabilization of the UBA5 homodimer, and enhances ATP-binding (PubMed:29295865). Transfer of UFM1 from UBA5 to the E2-like enzyme UFC1 also takes place using a trans mechanism

(PubMed:27653677, PubMed:34588452). Ufmylation plays a key role in various processes, such as ribosome recycling, response to DNA damage, interferon response or reticulophagy (also called ER-phagy) (PubMed:30412706, PubMed:32160526, PubMed:35394863). Ufmylation is essential for erythroid differentiation of both megakaryocytes and erythrocytes (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	UBA5 also known as Ubiquitin-like modifier-activating enzyme 5 is an E1 enzyme that plays a mechanical role in activating ubiquitin-fold modifier 1 (UFM1) for protein modification. It has a molecular mass of about 44 kDa and performs its function in the nucleus and cytoplasm within human cells. The expression of UBA5

	is not limited to specific tissues; instead it shows widespread expression across many tissues supporting an important role in various cellular processes.
Biological function summary	UBA5 is implicated in the UFM1 conjugation system. This process modifies specific proteins and affects protein stability interaction and degradation. UBA5 operates in complex with UFC1 an E2 enzyme enabling the transfer of UFM1 to target proteins. Its activity is essential for maintaining cellular homeostasis particularly in the endoplasmic reticulum stress response through protein modification and regulation tasks.
Pathways	The UBA5-UFM1 axis integrates into the cellular stress response pathway and the endoplasmic reticulum-associated degradation (ERAD) pathway. Through these pathways UBA5 collaborates with proteins like UFL1 further connecting these pathways by tagging proteins with UFM1 to mark them for degradation or functional modification. The coordination between UBA5 and UFL1 supports efficient protein quality control and maintains cellular equilibrium under stress conditions.
Associated diseases and disorders	The dysfunction or altered expression of UBA5 associates with neurodevelopmental disorders and some cancers. Changes in UBA5 activity can lead to imbalances in protein homeostasis contributing to pathogenic mechanisms in neurodevelopmental disorders where other proteins like EIF4A1 also play a role. In cancer alterations in UBA5 expression may influence tumor progression as seen in cases where UBA5 levels affect pathways that involve p53 an important tumor suppressor protein.

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

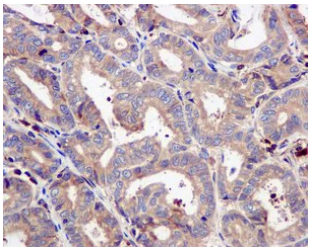
We do not recommend this combination. It is not covered by our product promise.

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.

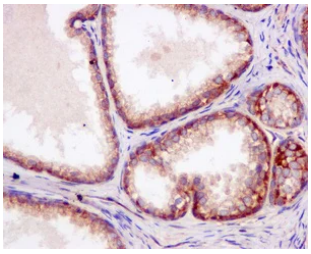
6 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-UBA5 antibody [EPR11729] (ab177478)

UBA5 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-UBA5 antibody

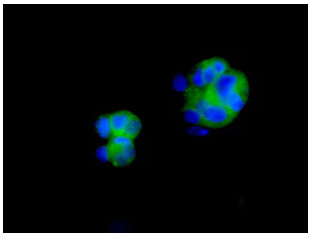
Immunohistochemical analysis of paraffin embedded Human prostate gastric carcinoma tissue labeling UBA5 with ab177478 at 1/50.
Perform heat mediated antigen retrieval before commencing with IHC staining protocol.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-UBA5 antibody [EPR11729] (ab177478)

UBA5 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-UBA5 antibody

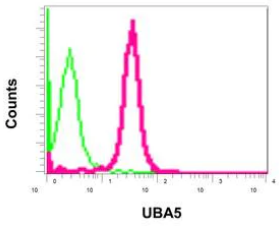
Immunohistochemical analysis of paraffin embedded Human prostate tissue labeling UBA5 with ab177478 at 1/50.
Perform heat mediated antigen retrieval before commencing with IHC staining protocol.



Immunocytochemistry/ Immunofluorescence - Anti-UBA5 antibody [EPR11729] (ab177478)

UBA5 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-UBA5 antibody

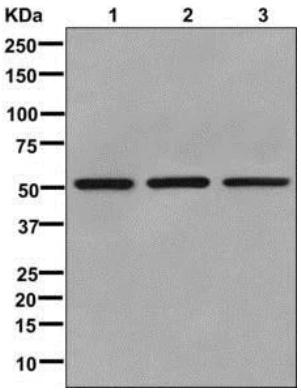
Immunofluorescent analysis of Caco-2 cells labeling UBA5 with ab177478 at 1/50 (green) and DAPI staining (blue).



Flow Cytometry (Intracellular) - Anti-UBA5 antibody [EPR11729] (ab177478)

UBA5 Flow Cytometry (Intracellular) staining using rabbit Anti-UBA5 antibody

Intracellular flow cytometrical analysis of permeabilized Jurkat cells labeling UBA5 with ab177478 at 1/10 (red) or a rabbit IgG (negative) (green).



Western blot - Anti-UBA5 antibody [EPR11729] (ab177478)

UBA5 Western blot staining using rabbit Anti-UBA5 antibody

All lanes:
Western blot - Anti-UBA5 antibody [EPR11729] (ab177478) at 1/1000 dilution

Lane 1:
Caco-2 cell lysate at 10 µg

Lane 2:
Jurkat cell lysate at 10 µg

Lane 3:
293T cell lysate at 10 µg

Secondary

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

Predicted band size: 45 kDa

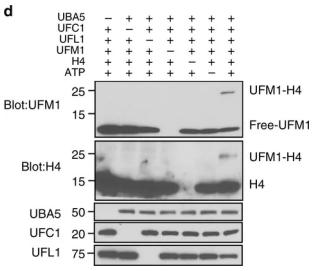


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Western blot - Anti-UBA5 antibody [EPR11729] (ab177478)

UBA5 Western blot staining using rabbit Anti-UBA5 antibody

Western Blotting using Anti-UBA5 antibody [EPR11729], ab177478. Publication image from Wang, L. et al., 2019, Nat Commun, 30886146. Legend direct from paper.

UFL1 monoufmylates histone H4 and promotes ATM activation. a Selected proteins identified by mass spectrometry from irradiated 293T cell expressing Flag-His vector or Flag-His-UFM1. N = 1 sample in each group was analyzed. The full list of identified proteins is provided in Supplementary Data 1. Among histone proteins, only H4 is enriched in the Flag-His-UFM1 purification (9 unique/20 total peptides) compared to the Flag-His purification (6 unique/7 total peptides), suggesting that H4 might be ufmylated. b Flag-His-ufmylated proteins were purified from 293T cells before and after IR (2 Gy) after purification with nickel beads and anti-Flag agarose. The immunoprecipitates were detected with indicated antibodies. c Flag-His-ufmylated H4 was purified from control and UFL1 knockdown cells with or without 2 Gy IR and blotted with indicated antibodies. d In vitro ufmylation assay. Purified UBA5, UFC1, UFL1, UFM1, and H4 proteins were incubated together in the presence of ATP and MgCl2 at 30 °C for 90 min. The reaction products were probed with indicated antibodies. e Wildtype (WT) histone H4 and 11 different single lysine (K) to arginine (R) mutants were transfected into U2OS cells. Flag and His tandem purification was performed and H4 ufmylation was analyzed. f Constructs expressing WT or K31R H4 were transfected into U2OS tet-on UFL1 shRNA expressing cells, and the cells were treated with doxycycline as indicated. Thirty minutes after 2 Gy IR, the cells were harvested and blotted with indicated antibodies. g Colony formation of U2OS cells expressing WT H4 or H4K31R following IR. The data presented are mean ± s.e.m. for n = 3 independent experiments. Statistical significance was calculated using two-way ANOVA. *p < 0.05, **p < 0.01. h U2OS cells stably expressing UFL1 Tet-on shRNA were treated with doxycycline (Dox) and irradiated with 2 Gy IR. Thirty minute later, cells were harvested. Half of the cells were lysed. Chromatin fractions were isolated from other half of cells. The samples were blotted with indicated antibodies. Source data are provided as a Source Data file

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