abcam

ab214428

Anti-Cathepsin B antibody [EPR21033]

Anti-Cathepsin B antibody [EPR21033] (ab214428) is a rabbit monoclonal antibody detecting Cathepsin B in **Western Blot, Flow Cytometry (Intra), IHC-P, ICC/IF**. Suitable for **Mouse, Rat**.

- Biophysical QC for unrivalled batch-batch consistency
- Over 10 publications

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	EPR21033
Purification technique	Affinity purification Protein A
Concentration	0.515 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

WB

Tested

Species	Mouse

Dilution info	1/1000
Notes	-

Species	Rat
Dilution info	1/1000
Notes	-

Not recommended

Species	Human
Dilution info	-
Notes	-

ICC/IF

Tested

Species	Mouse
Dilution info	1/250
Notes	-

Species	Rat
Dilution info	1/250
Notes	-

Not recommended

Species	Human
Dilution info	-
Notes	-

Flow Cyt (Intra)

Tested

Species	Mouse
Dilution info	1/500

Notes	-

Expected

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

Not recommended

Species	Human
Dilution info	-
Notes	-

IHC-P

Tested

Species	Mouse
Dilution info	1/1000
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Species	Rat
Dilution info	1/1000
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Not recommended

Species	Human
Dilution info	-
Notes	-

Target data

See full target information CATB_MOUSE

Function	Thiol protease which is believed to participate in intracellular degradation and turnover of proteins (By similarity). Cleaves matrix extracellular phosphoglycoprotein MEPE (By similarity). Involved in the solubilization of cross-linked TG/thyroglobulin in the thyroid follicle lumen (PubMed:12782676). Has also been implicated in tumor invasion and metastasis (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

What is this antibody validated in?
Anti-Cathepsin B antibody [EPR21033] (ab214428) is a rabbit recombinant monoclonal antibody and is validated for use in Western Blot (WB), Flow Cytometry (Intra), Immunohistochemistry (IHC-P), Immunocytochemistry/immunofluorescence (ICC/IF) in Mouse, Rat samples.

What is the molecular weight of Cathepsin B?
Anti-Cathepsin B [EPR21033] (ab214428) specifically detects a band for Cathepsin B (UniProt: P10605) at a molecular weight of 37kDa.

Trusted by the scientific community
Anti-Cathepsin B [EPR21033] (ab214428) was first used in a scientific publication in 2017 and has been cited over 10 times in peer-reviewed journals.

Reviewed by scientists
Anti-Cathepsin B [EPR21033] (ab214428) has over 5 independent reviews from customers.

Other related products
We have a range of other formats of antibody clone [EPR21033] also available for your convenience: ab214428, Carrier free - ab227811

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.

Trial sizes available!
Test your antibody or perform pre-screening before committing to a larger quantity. Sold in 20µl. Discover our selection of trial-size antibodies.

Supplementary info

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

Activity summary	Cathepsin B also known as CTSB or cathepsin beta is a lysosomal cysteine protease belonging to the papain family. This enzyme possesses a molecular weight of approximately 25 to 30 kDa. You can find cathepsin B expressed in various tissues with high levels observed in the liver kidney and spleen. It plays a mechanical role in protein degradation within lysosomes operating optimally in acidic environments. The enzyme has active and inactive forms depending on structural modifications and environmental conditions.
Biological function summary	Cathepsin B participates as a proteolytic enzyme involved in protein turnover and processing. It does not function in isolation but often associates with various other proteases forming complexes essential for efficient substrate breakdown. Cathepsin B assists in the activation of other enzymes by cleaving propeptides therefore facilitating the initiation of cascade reactions. This role is critical in maintaining cellular homeostasis and modulating physiological processes including cell migration and immune response modulation.
Pathways	Cathepsin B significantly contributes to the lysosomal protein degradation pathway and the autophagy-lysosome pathway. It interacts with proteins such as B protein which are important for cellular recycling and energy homeostasis. Its activity supports the MHC class II antigen processing pathway playing an essential part in immune system functionality. Cathepsin B also exhibits interactions with Ctsb protein inhibitors which regulate its proteolytic activity within these pathways.
Associated diseases and disorders	Cathepsin B has strong associations with cancer progression and neurological disorders such as Alzheimer's disease. Its overexpression and dysregulation are linked to tumor metastasis where it degrades extracellular matrix components promoting invasion. Ctsb protein interactions with corey mazo proteins influence tumor microenvironment and immune evasion. In Alzheimer's disease cathepsin B can influence amyloid beta peptide processing connected to neurodegenerative pathology progression. These roles highlight the potential for cathepsin B as a therapeutic target in addressing these conditions.

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

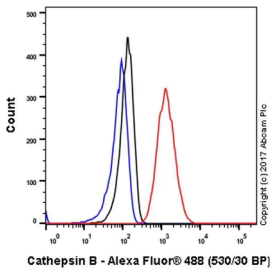
We do not recommend this combination. It is not covered by our product promise.

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.

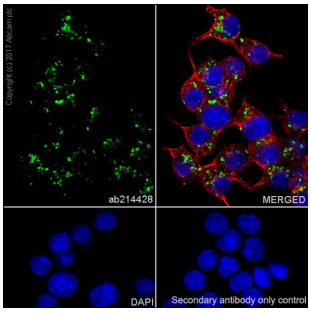
7 product images



Flow Cytometry (Intracellular) - Anti-Cathepsin B antibody [EPR21033] (ab214428)

Cathepsin B Flow Cytometry (Intracellular) staining using rabbit Anti-Cathepsin B antibody

Intracellular flow cytometric analysis of4% paraformaldehyde-fixed, 90% methanol-permeabilized RAW 264.7 (mouse macrophage cell line transformed with Abelson murine leukemia virus) cell line labeling Cathepsin B with ab214428 at 1/500 dilution (red) compared with a Rabbit IgG, monoclonal [EPR25A] - Isotype Control (ab172730) (black) and an unlabeled control (cells without incubation with primary antibody and secondary antibody) (blue). Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077), at 1/2000 dilution was used as the secondary antibody.

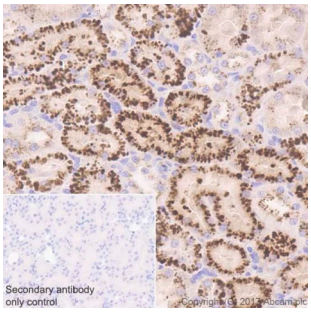


Immunocytochemistry/ Immunofluorescence - Anti-Cathepsin B antibody [EPR21033] (ab214428)

Cathepsin B Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-Cathepsin B antibody

Immunofluorescent analysis of 100% methanol-fixed RAW 264.7 (mouse macrophage cell line transformed with Abelson murine leukemia virus) cells labeling Cathepsin B with ab214428 at 1/250 dilution, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution (green). Confocal image showing cytoplasmic staining in RAW 264.7 cells.
The nuclear counterstain is DAPI (blue). Tubulin is detected with Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) (ab195889) at 1/200 dilution (red).

Secondary antibody only control: Used PBS instead of primary antibody, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution.

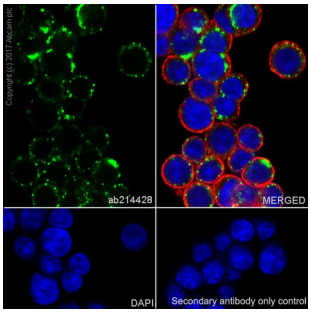


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Cathepsin B antibody [EPR21033] (ab214428)

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

Immunohistochemical analysis of paraffin-embedded rat kidney tissue labeling Cathepsin B with ab214428 at 1/1000 dilution, followed by secondary Goat Anti-Rabbit IgG H&L (HRP) Ready to use. Punctate cytoplasmic staining on rat kidney (PMID: 20668705; PMID: 26831567) is observed. Counter stained with hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) Ready to use.

Perform heat mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

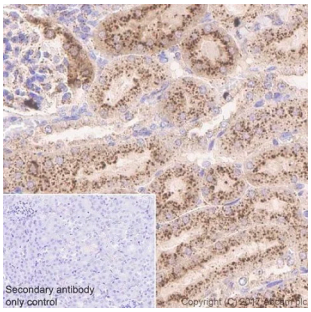


Immunocytochemistry/ Immunofluorescence - Anti-Cathepsin B antibody [EPR21033] (ab214428)

Cathepsin B Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-Cathepsin B antibody

Immunofluorescent analysis of 100% methanol-fixed PC-12 (rat adrenal gland pheochromocytoma cell line) cells labeling Cathepsin B with ab214428 at 1/250 dilution, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution (green). Confocal image showing cytoplasmic staining on PC-12 cells.
The nuclear counterstain is DAPI (blue). Tubulin is detected with Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) (ab195889) at 1/200 dilution (red).

Secondary antibody only control: Used PBS instead of primary antibody, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution.

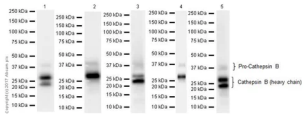


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Cathepsin B antibody [EPR21033] (ab214428)

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

Immunohistochemical analysis of paraffin-embedded mouse kidney tissue labeling Cathepsin B with ab214428 at 1/1000 dilution, followed by secondary Goat Anti-Rabbit IgG H&L (HRP) Ready to use. Punctate cytoplasmic staining on mouse kidney (PMID: 20668705; PMID: 26831567) is observed. Counter stained with hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) Ready to use.

Perform heat mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.



Western blot - Anti-Cathepsin B antibody [EPR21033] (ab214428)

Cathepsin B Western blot staining using rabbit Anti-Cathepsin B antibody

Exposure times: Lanes 1,2: 23 seconds; Lane 3: 50 seconds; Lane 4: 15 seconds; Lane 5: 2 minutes.

Blocking/Dilution buffer: 5% NFDM/TBST.

The expression profile and molecular mass is consistent with what has been described in the literature (PMID:20536394; PMID: 10447678).

All lanes:
Western blot - Anti-Cathepsin B antibody [EPR21033] (ab214428) at 1/1000 dilution

Lane 1:
Mouse kidney tissue lysate at 10 µg

Lane 2:
RAW 264.7 (mouse macrophage cell line transformed with Abelson murine leukemia virus) whole cell lysate at 10 µg

Lane 3:
Rat thymus tissue lysate at 10 µg

Lane 4:
Rat kidney tissue lysate at 10 µg

Lane 5:
PC-12 (rat adrenal gland pheochromocytoma cell line) whole cell lysate at 10 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/100000 dilution

Developed using the ECL technique.

Predicted band size: 38 kDa

Observed band size: 25 kDa, 31 kDa, 43 kDa

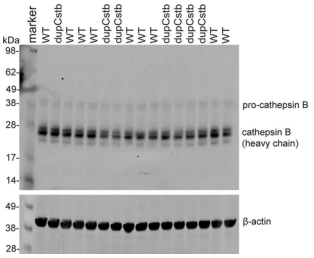


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Western blot - Anti-Cathepsin B antibody [EPR21033] (ab214428)

Cathepsin B western blot using anti-Cathepsin B antibody [EPR21033] ab214428. Publication image and figure legend from Wu, Y., Whittaker, H. T., et al., 2021, PLoS One, PubMed 34292972.

ab214428 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 ab214428 please see the product overview.

Activity of cathepsin B in cortical lysates of 3- and 6- month-old mice.Total cortical proteins were used to determine enzyme activity, as the gain in fluorescence during the linear portion of the reaction curve relative to the wildtype mean. (A) Cortical relative cathepsin B activity at 3-months of age, graphed as group means ± SEM (n = 18 per genotype; (22 females and 14 males in total), revealed no statistically significant effects of dupCstb or sex (univariate ANOVA). (B) Cortical relative cathepsin B activity at 6-months of age, graphed as group means ± SEM, (dupCstb n = 7, wildtype n = 9; 7 females and 9 males in total), revealed no statistically significant effects of dupCstb or sex (univariate ANOVA). Recombinant human cathepsin B (R&D Systems, Cat. No. 953-CY-010) was used as a positive control. (C) Representative western blot probed with an anti-cathepsin B antibody that recognises pro-cathepsin B and cathepsin B heavy chain and an anti-β-actin antibody. (D) Protein band densities of pro-cathepsin B and cathepsin B heavy chain were quantified using ImageJ, normalised to β-actin, and are shown as cathepsin B/pro-cathepsin B ratio in the dupCstb group relative to the ratio in wildtype, graphed as group mean ± SEM (dupCstb n = 7, wildtype n = 9; 7 females and 9 males in total).

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