abcam

ab133641

Anti-Cathepsin L/V/K/H antibody [EPR8011]

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	EPR8011
Purification technique	Affinity purification Protein A
Dissociation constant	4.4 x 10^{-11} M
Concentration	0.11 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	**For unpurified use at 1/50 - 1/100.**

	Perform heat-mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol.

Expected

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

ELISA

Tested

Species	Human
Dilution info	-
Notes	-

Expected

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

WB

Tested

Species	Mouse
Dilution info	1/10000
Notes	**For unpurified use at 1/1000 - 1/10000.**

Species	Rat
Dilution info	1/10000
Notes	**For unpurified use at 1/1000 - 1/10000.**

Species	Human
Dilution info	1/10000

Notes	**For unpurified use at 1/1000 - 1/10000.**

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	-
Notes	-

Expected

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

Target data

See full target information CTSL

Function	Thiol protease important for the overall degradation of proteins in lysosomes (Probable). Plays a critical for normal cellular functions such as general protein turnover, antigen processing and bone remodeling. Involved in the solubilization of cross-linked TG/thyroglobulin and in the subsequent release of thyroid hormone

thyroxine (T4) by limited proteolysis of TG/thyroglobulin in the thyroid follicle lumen (By similarity). In neuroendocrine chromaffin cells secretory vesicles, catalyzes the prohormone proenkephalin processing to the active enkephalin peptide neurotransmitter (By similarity). In thymus, regulates CD4(+) T cell positive selection by generating the major histocompatibility complex class II (MHCII) bound peptide ligands presented by cortical thymic epithelial cells. Also mediates invariant chain processing in cortical thymic epithelial cells (By similarity). Major elastin-degrading enzyme at neutral pH. Accumulates as a mature and active enzyme in the extracellular space of antigen presenting cells (APCs) to regulate degradation of the extracellular matrix in the course of inflammation (By similarity). Secreted form generates endostatin from COL18A1 (PubMed:10716919). Critical for cardiac morphology and function. Plays an important role in hair follicle morphogenesis and cycling, as well as epidermal differentiation (By similarity). Required for maximal stimulation of steroidogenesis by TIMP1 (By similarity). (Microbial infection) In cells lacking TMPRSS2 expression, facilitates human coronaviruses SARS-CoV and SARS-CoV-2 infections via a slow acid-activated route with the proteolysis of coronavirus spike (S) glycoproteins in lysosome for entry into host cell (PubMed:16339146, PubMed:18562523, PubMed:32142651, PubMed:32221306, PubMed:37990007). Proteolysis within lysosomes is sufficient to activate membrane fusion by coronaviruses SARS-CoV and EMC (HCoV-EMC) S as well as Zaire ebolavirus glycoproteins (PubMed:16081529, PubMed:18562523, PubMed:26953343). Isoform 2. Functions in the regulation of cell cycle progression through proteolytic processing of the CUX1 transcription factor (PubMed:15099520). Translation initiation at downstream start sites allows the synthesis of isoforms that are devoid of a signal peptide and localize to the nucleus where they cleave the CUX1 transcription factor and modify its DNA binding properties (PubMed:15099520).

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.

Supplementary info

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

Activity summary	Cathepsins L V K and H are essential cysteine proteases that serve important functions in protein catabolism. These proteases participate in proteolytic processes by digesting proteins into shorter peptides and amino acids. Cathepsin L also known as CTSL typically has a molecular mass of about 25-35 kDa and is expressed in various tissues such as the liver spleen and placenta. Cathepsin K plays a similar role in bone resorption and is highly expressed in osteoclasts. Cathepsin V and Cathepsin H meanwhile have distinct tissue distributions with cathepsin V often found in the thymus and testis whereas cathepsin H's expression spans across different cell types contributing a vast array of biological functions.
Biological function summary	Cathepsins regulate cellular homeostasis and modulate various physiological processes. These proteases perform their functions within the lysosomal compartment although they can also participate in extracellular matrix remodeling and other non-lysosomal roles. Cathepsin K for example is part of the cathepsin protein family and aids in degrading collagen therefore playing a pivotal role in bone turnover and resorption. Cathepsins can act independently or in some cases are part of larger enzyme complexes enhancing their proteolytic activity to handle different substrates driven by the physiological demand.
Pathways	Cathepsins key in the lysosomal degradation pathway and influence other signaling cascades like the apoptotic pathway. The regulation of these pathways often involves interactions with other proteins such as pro-apoptotic members of the Bcl-2 family facilitating cell death under certain conditions. Cathepsin L contributes to the antigen processing pathway linking it to the immune response. Cathepsin K on the other hand acts closely with structural proteins like collagen in the bone metabolism pathway highlighting its significance in skeletal development and maintenance.

Associated diseases and disorders	Altered cathepsin activity closely associates with conditions like osteoporosis and cancer. Cathepsin K upregulation can lead to excessive bone degradation seen in osteoporosis while aberrant cathepsin L expression relates to cancer progression and metastasis due to its role in degrading extracellular matrix components facilitating tumor invasion. In osteoporosis interactions with matrix metalloproteinases further enhance bone matrix breakdown exacerbating disease symptoms. In cancer the relationship between cathepsin L and the urokinase-type plasminogen activator system highlights its role in promoting malignancy and suggests potential therapeutic targets.

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

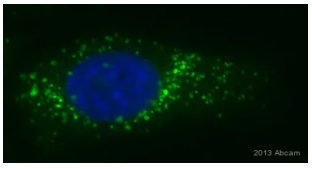
We do not recommend this combination. It is not covered by our product promise.

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.

15 product images



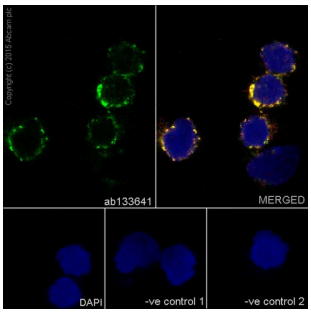
This image is courtesy of a customer review submitted by Alina Macovei

Immunocytochemistry/ Immunofluorescence - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Cathepsin L/V/K/H Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-Cathepsin L/V/K/H antibody

Unpurified ab133641 staining Cathepsin L in Human HepaRG cell by ICC/IF (Immunocytochemistry/immunofluorescence). Cells were fixed with formaldehyde, permeabilized with 0.1% Triton X-100 and blocked with 1% milk for 30 minutes at room temperature. Samples

were incubated with primary antibody (1/1000) for 30 minutes. An Alexa Fluor® 488-conjugated Donkey anti-rabbit IgG polyclonal (1/400) was used as the secondary antibody.

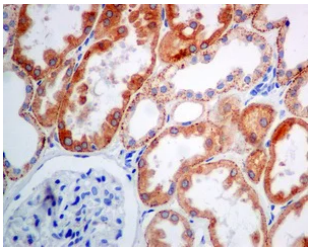


Immunocytochemistry/ Immunofluorescence - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Cathepsin L/V/K/H Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-Cathepsin L/V/K/H antibody

Immunocytochemistry/Immunofluorescence analysis of HT-29 cells labelling Cathepsin L with purified ab133641 at 1/100. Cells were fixed with 100% methanol 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 (1/500) and ab150120 an Alexa Fluor® 594-conjugated goat anti-mouse IgG (1/500) were also used.
Control 1: primary antibody (1/100) and secondary antibody ab150120 an Alexa Fluor® 594-conjugated goat anti-mouse IgG (1/500).

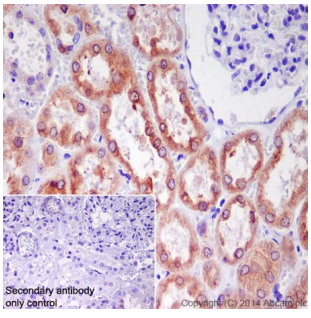
Control 2: ab7291 (1/1000) and secondary antibody ab150077 an Alexa Fluor® 488-conjugated goat anti-rabbit IgG (1/500).



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Cathepsin L/V/K/H Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-Cathepsin L/V/K/H antibody

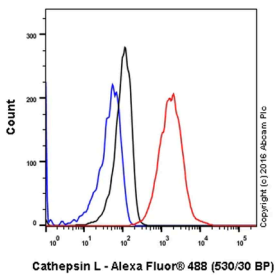
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of human kidney tissue labelling Cathepsin L with unpurified ab133641 at a 1/50 dilution.
Perform heat mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Cathepsin L/V/K/H Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-Cathepsin L/V/K/H antibody

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of human kidney tissue labelling Cathepsin L with purified ab133641 at 1/100. Heat mediated antigen retrieval was performed using Tris/EDTA buffer pH 9. ab97051 a HRP-conjugated goat anti-rabbit IgG (H+L) was used as the secondary antibody (1/500). Negative control using PBS instead of primary antibody. Counterstained with hematoxylin.

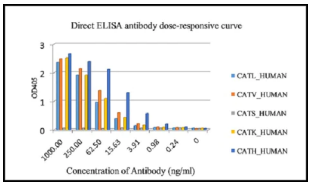


Flow Cytometry (Intracellular) - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Cathepsin L/V/K/H Flow Cytometry (Intracellular) staining using rabbit Anti-Cathepsin L/V/K/H antibody

ab133641 staining Cathepsin Lin the human cell line HepG2 (human hepatocellular carcinoma) by intracellular flow cytometry. Cells were fixed with 4% paraformaldehyde and the sample was incubated with the primary antibody at a dilution of 1/20. A goat anti rabbit IgG (Alexa Fluor® 488) at a dilution of 1/2000 was used as the secondary antibody.
Isoytype control: Rabbit monoclonal IgG (Black)

Unlabelled control: Cell without incubation with primary antibody and secondary antibody (Blue)



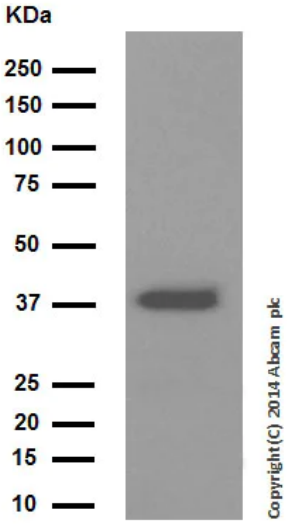
ELISA - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Antigen: CATL_HUMAN CATV_HUMAN CATS_HUMAN CATK_HUMAN CATH_HUMAN
Antigen concentration: 1000ng/ml

Primary antibody concentration range: 0~1000ng/ml

Secondary antibody: Alkaline Phosphatase-conjugated AffiniPure Goat Anti-Rabbit IgG(H+L)

Secondary antibody concentration: 1/2500



Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Blocking and dilution buffer: 5% NFDM/TBST.
All lanes:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/20000 dilution

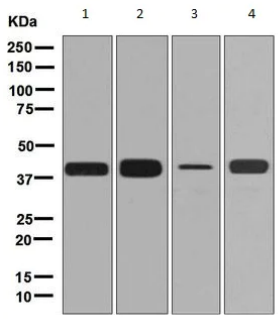
All lanes:
HepG2 cell lysate at 20 µg

Secondary

All lanes:
Peroxidase conjugated goat anti-rabbit IgG (H+L) at 1/1000 dilution

Predicted band size: 38 kDa

Observed band size: 38 kDa



Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Cathepsin L/V/K/H Western blot staining using rabbit Anti-Cathepsin L/V/K/H antibody

All lanes:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/1000 dilution

Lane 1:
A549 cell lysate at 10 µg

Lane 2:
HCT-116 cell lysate at 10 µg

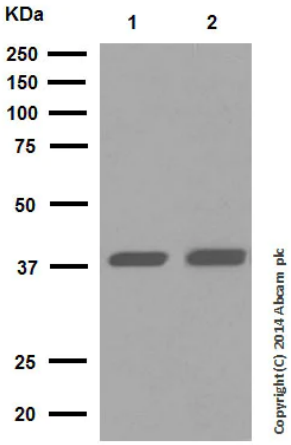
Lane 3:
NIH/3T3 cell lysate at 10 µg

Lane 4:
PC-12 cell lysate at 10 µg

Secondary

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

Predicted band size: 38 kDa



Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Cathepsin L/V/K/H Western blot staining using rabbit Anti-Cathepsin L/V/K/H antibody

Blocking and dilution buffer: 5% NFDM/TBST.
All lanes:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/10000 dilution

Lane 1:
HCT-116 cell lysate at 10 µg

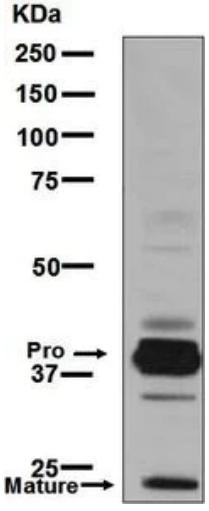
Lane 2:
A549 cell lysate at 10 µg

Secondary

All lanes:
Peroxidase conjugated goat anti-rabbit IgG (H+L) at 1/1000 dilution

Predicted band size: 38 kDa

Observed band size: 38 kDa



Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

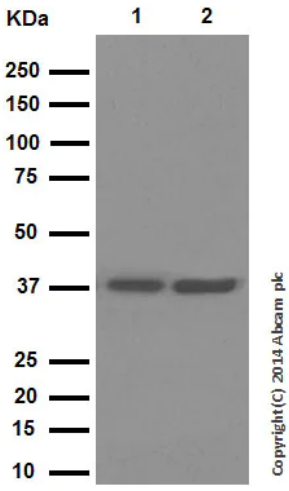
All lanes:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/1000 dilution

All lanes:
HepG2 cell lysate at 10 µg

Secondary

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

Predicted band size: 38 kDa



Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Cathepsin L/V/K/H Western blot staining using rabbit Anti-Cathepsin L/V/K/H antibody

Blocking and dilution buffer: 5% NFDM/TBST.
All lanes:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/20000 dilution

Lane 1:
NIH/3T3 cell lysate at 20 µg

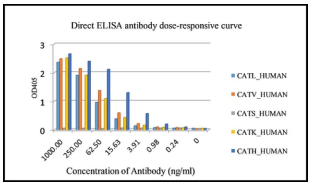
Lane 2:
PC-12 cell lysate at 20 µg

Secondary

All lanes:
Peroxidase conjugated goat anti-rabbit IgG (H+L) at 1/1000 dilution

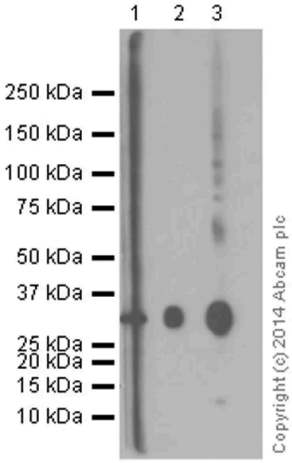
Predicted band size: 38 kDa

Observed band size: 38 kDa



ELISA - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

Direct ELISA antigen dose-response curve using purified ab133641.Antigen concentration of 1000ng/mL.Alkaline Phosphatase conjugated AffiniPure goat anti-rabbit IgG(H+L)(1/2500) was used as the secondary antibody.



Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

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

Observed MW:30

Exposure time:3 minutes

Lane 1:
Western blot - Anti-Cathepsin L + V antibody [33/2] (ab6314) at 1/20 dilution

Lane 1:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/20 dilution

Lane 2:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/100 dilution

Lane 2:
Western blot - Anti-Cathepsin L + V antibody [33/2] (ab6314) at 1/100 dilution

Lane 3:
Anti-His tag at 1/10000 dilution

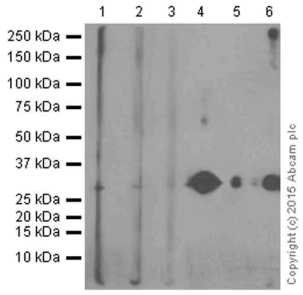
All lanes:
Human Cathepsin L recombinant protein fraction

Secondary

Lanes 1 and 3:
Peroxidase conjugated Goat Anti-Rabbit IgG, (H+L) at 1/1000 dilution

Lane 2:
Rabbit anti-Mouse IgG at 1/2000 dilution

Predicted band size: 38 kDa



Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

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

Observed MW:30

Exposure time:3 minutes

Lane 1:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/20 dilution

Lane 1:
Western blot - Anti-Cathepsin L + V antibody [33/2] (ab6314) at 1/20 dilution

Lanes 2 and 4:
Western blot - Anti-Cathepsin L + V antibody [33/2] (ab6314) at 1/100 dilution

Lanes 2 and 4:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/100 dilution

Lane 3:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/500 dilution

Lane 3:
Western blot - Anti-Cathepsin L + V antibody [33/2] (ab6314) at 1/500 dilution

Lane 5:
Western blot - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641) at 1/1000 dilution

Lane 5:
Western blot - Anti-Cathepsin L + V antibody [33/2] (ab6314) at 1/1000 dilution

Lane 6:
Anti-His tag at 1/10000 dilution

All lanes:
Human Cathepsin V recombinant protein fraction

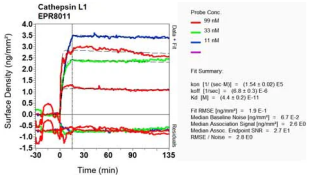
Secondary

Lanes 1 - 3:
Peroxidase conjugated Goat Anti-Rabbit IgG, (H+L) at 1/1000 dilution

Lanes 4 - 5:
Rabbit Anti-Mouse secondary ab at 1/2000 dilution

Lane 6:
Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated at 1/1000 dilution

Predicted band size: 38 kDa



OI-RD Scanning - Anti-Cathepsin L/V/K/H antibody [EPR8011] (ab133641)

We have systematically measured KD (the equilibrium dissociation constant between the antibody and its antigen), of more than 840 recombinant antibodies to assess not only their individual KD values but also to see the average affinity of antibody. Based on the comparison with published literature values for mouse monoclonal antibodies, Recombinant antibodies appear to be on average 1-2 order of magnitude higher affinity.

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