abcam

ab39012

Anti-MMP13 antibody

Anti-MMP13 antibody (ab39012) is a rabbit polyclonal antibody detecting MMP13 in **Western Blot, Flow Cytometry, IHC-P, IHC-Fr, ICC/IF, ELISA**. Suitable for **Dog, Human, Mouse, Rat**.

- Over 510 publications
- Trusted since 2006

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	Preservative: 0.05% Sodium azide Constituents: 50% Glycerol (glycerin, glycerine)
Form	Liquid
Clonality	Polyclonal
Immunogen	Synthetic Peptide within Human MMP13. The exact immunogen used to generate this antibody is proprietary information. Database link P45452
Purification technique	Affinity purification Immunogen
Specificity	ab39012 recognizes the latent proenzyme, at 60 Kd, as well as the active form at 48 Kd, and intermediate activation forms. It does not cross react with the other MMP family members. ab39012 recognizes the Hinge region of MMP13.
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →
Purification notes	The antibody has been peptide-affinity purified.

Reactivity data

Flow Cyt

Expected

Species	Mouse
Dilution info	-
Notes	ab171870 - Rabbit polyclonal IgG, is suitable for use as an isotype control with this antibody.

Species	Rat
Dilution info	-
Notes	ab171870 - Rabbit polyclonal IgG, is suitable for use as an isotype control with this antibody.

Species	Human
Dilution info	-
Notes	ab171870 - Rabbit polyclonal IgG, is suitable for use as an isotype control with this antibody.

Species	Dog
Dilution info	-
Notes	ab171870 - Rabbit polyclonal IgG, is suitable for use as an isotype control with this antibody.

Not recommended

Species	Synthetic peptide - Human
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	1/3000 - 1/6000
Notes	1/3000, when using colorimetric substrates such as BCIP/NBT - 1/6000, when using chemiluminescent substrates. Dilution optimised using Chromogenic detection. When used against the reduced protein identifies a band at 60 Kd. Note: The low endogenous protein levels may require concentration of samples by ultrafiltration or ammonium sulfate precipitation prior to Western blotting.

Predicted

Species	Mouse, Dog, Rat
Dilution info	-
Notes	-

Not recommended

Species	Synthetic peptide - Human
Dilution info	-
Notes	-

sELISA

Tested

Species	Synthetic peptide - Human
Dilution info	-
Notes	For sandwich ELISA, use this antibody as Detection at 0.5µg/ml with ab77949 as Capture.

Expected

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

Predicted

Species	Mouse, Dog, Rat
Dilution info	-
Notes	-

IHC-P

Expected

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

Not recommended

Species	Synthetic peptide - Human
Dilution info	-
Notes	-

ICC/IF

Expected

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

Not recommended

Species	Synthetic peptide - Human
Dilution info	-
Notes	-

IHC-Fr

Expected

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

Not recommended

Species	Synthetic peptide - Human
Dilution info	-

Notes	-

Target data

See full target information MMP13

Function	Plays a role in the degradation of extracellular matrix proteins including fibrillar collagen, fibronectin, TNC and ACAN. Cleaves triple helical collagens, including type I, type II and type III collagen, but has the highest activity with soluble type II collagen. Can also degrade collagen type IV, type XIV and type X. May also function by activating or degrading key regulatory proteins, such as TGFB1 and CCN2. Plays a role in wound healing, tissue remodeling, cartilage degradation, bone development, bone mineralization and ossification. Required for normal embryonic bone development and ossification. Plays a role in the healing of bone fractures via endochondral ossification. Plays a role in wound healing, probably by a mechanism that involves proteolytic activation of TGFB1 and degradation of CCN2. Plays a role in keratinocyte migration during wound healing. May play a role in cell migration and in tumor cell invasion.

Storage

Shipped at conditions	Blue Ice
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

Product Specifications

Anti-MMP13 antibody (ab39012) is a rabbit polyclonal antibody and is validated for use in Flow Cyt, ICC/IF, IHC-Fr, IHC-P, WB, sELISA in dog, human, mouse, rat samples.

Anti-MMP13 antibody (ab39012) specifically detects MMP13 (UniProt ID: P45452; Molecular weight: 42kDa) and is sold in 100 µg selling sizes.

Quality and Validation

Abcam's high quality validation processes ensure Anti-MMP13 antibody (ab39012) has high sensitivity and specificity.

Anti-MMP13 antibody (ab39012) has been cited over 517 times in peer reviewed journals and is trusted by the

scientific community.
Anti-MMP13 antibody (ab39012) has 18 independent reviews from customers.

Supplementary info

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

Activity summary	Matrix metallopeptidase 13 (MMP-13) also called collagenase 3 is an enzyme with an approximate molecular mass of 54 kDa. It plays a significant role in the breakdown of extracellular matrix components particularly collagen. MMP-13 is expressed in several tissues including cartilage skin and bone. Its expression sees an increase during tissue remodeling and in pathological conditions. MMP-13 also participates in processes like wound healing and embryonic development making it a focal point for understanding tissue dynamics.
Biological function summary	Matrix metallopeptidase 13 contributes extensively to the degradation of collagen type II a major component of cartilage. As a zinc-dependent endopeptidase MMP-13 is part of the MMP family which facilitates the remodeling of the extracellular matrix. MMP-13 is involved in the proteolytic cascade working in conjunction with other MMPs and elastase to mediate tissue repair and turnover. It does not form complexes but acts in concert with other enzymes to execute its physiological functions effectively.
Pathways	Matrix metallopeptidase 13 significance is most noted in the cartilage degradation pathway. It interacts with other MMPs such as MMP-1 and MMP-9 to efficiently break down extracellular matrix components. These interactions highlight its role in the regulation of matrix metalloproteinase activity within the connective tissue degradation pathway. These pathways are key during normal connective tissue remodeling and in pathological processes illustrating the essential roles of MMPs in maintaining tissue homeostasis.
Associated diseases and disorders	Matrix metallopeptidase 13 has strong associations with osteoarthritis and rheumatoid arthritis. It contributes to cartilage destruction intensifying the progression of these disorders due to its potent collagenolytic activity. Other proteins like MMP-9 and MMP-14 are also involved in these processes potentially amplifying tissue damage in affected joints. Understanding how MMP-13 and related proteins drive these diseases offers potential therapeutic targets for slowing disease progression and enhancing joint health.

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.

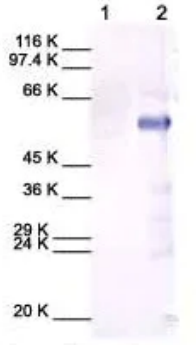
We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

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:
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8 product images



Western blot - Anti-MMP13 antibody (ab39012)

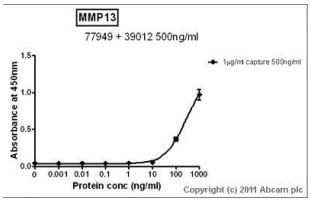
The loading amount is 15 ul/lane, and the condrosarcoma media was concentrated 40x.
All lanes:
Western blot - Anti-MMP13 antibody (ab39012) at 1/3000 dilution

Lane 1:
cell media from human chondrosarcoma (untreated).

Lane 2:
cell media from human chondrosarcoma (IL1 beta treated).

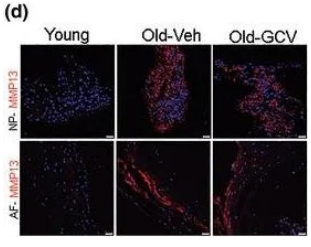
Predicted band size: 54 kDa

Observed band size: 60 kDa



Sandwich ELISA - Anti-MMP13 antibody (ab39012)

Standard curve for MMP13; dilution range 1pg/ml to 1µg/ml using Capture Antibody Mouse monoclonal [181-15A12] to MMP13 (ab77949) at 1µg/ml and Detector Antibody Rabbit polyclonal to MMP13 - Hinge region (ab39012) at 0.5µg/ml.



Immunohistochemistry (Frozen sections) - Anti-MMP13 antibody (ab39012)

MMP13 Immunohistochemistry (Frozen sections) staining using rabbit Anti-MMP13 antibody

MMP13 immunohistochemistry-immunofluorescence using Anti-MMP13 antibody ab39012. Publication image and figure legend from Patil, P., Dong, Q., et al., 2019, Aging Cell, Pubmed

Image collected and cropped by CiteAb under a CC-BY license from the publication

30900385.

Effects of GCV treatment on aggrecan and MMP13 mRNA and protein levels in intervertebral discs of p16-3MR mice. Aggrecan mRNA levels were quantified by qRT-PCR (a), and protein was quantified by immunofluorescence signals (b) in nucleus pulposus and annulus fibrosus section of disc tissue. MMP13 expression of whole disc mRNA by qRT-PCR (c) and protein by immunofluorescence (d) in inner nucleus pulposus and outer annulus fibrosus section of disc tissue. Graphs on the right are quantification of the immunofluorescence results. Data shown are mean ± SEM of four independent experiments (4 mice), *p < < 0.05, ***p < < 0.001. Scale bar = 10 µm

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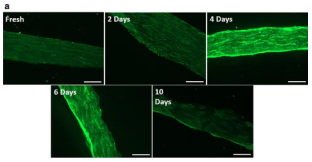


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Immunohistochemistry (Frozen sections) - Anti-MMP13 antibody (ab39012)

MMP13 Immunohistochemistry (Frozen sections) staining using rabbit Anti-MMP13 antibody

MMP13 immunohistochemistry-immunofluorescence using Anti-MMP13 antibody ab39012. Publication image and figure legend from Jafari, L., Savard, M., et al., 2019, Biomed Eng Online, Pubmed 31068196.

immunohistochemistry analysis of MMP-13. a Representative epifluorescence micrographs of freshly isolated and SD tendons stained for MMP-13 protein using the rabbit polyclonal anti-MMP-13 antibody ab39012. Scale bar = 200 µm. b Bar graph illustrating semiquantitative MMP-13 immunofluorescent intensity in freshly isolated tendons and SD tendons. Inset: consolidation of increased MMP-13 in one tendon sample by PCR analysis. *p < < 0.050 versus control fresh tendons

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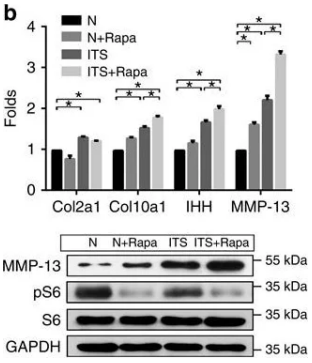


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Western blot - Anti-MMP13 antibody (ab39012)

MMP13 Western blot staining using rabbit Anti-MMP13 antibody

Western Blotting using Anti-MMP13 antibody, ab39012. Publication image from Wang, H. et al., 2016, Nat Commun, 27039827. Legend direct from paper.

Inhibition of mTORC1 prevents chondrocyte proliferation while promoting differentiation.(a) CCK8 proliferation assay of chondrocytes cultured in normal growth medium or with 1, 10 or 50 nM rapamycin treatment. OD450values were converted to cell numbers. One-way analysis of variance (ANOVA) and Dunnett's multiple comparison test; NS, not significant, *P<0.05, n=5; Error bars indicate s.d. (b) qPCR and western blot analysis of primary chondrocytes cultured in growth medium or ITS medium. Cells were treated with or without rapamycin from day 6 and were harvested on day 14 after confluence. One-way ANOVA and Dunnett's multiple comparison test, *P<0.05, n≥3; Error bars indicate s.d. (c) HE staining, pS6 immunofluorescence and MMP-13 in situ mRNA analysis of Tibia sections of mice at P0 whose maternal mice receiving a daily intraperitoneal injection of rapamycin (1.5 mg kg−1 per day) or 0.9% saline for 3 days before sacrifice. Scale bar, 100 µm. PZ, proliferative chondrocyte zone; HZ, hypertrophic chondrocyte zone. (d) Quantification of Tibia PZ and HZ length in P0 mice receiving rapamycin. Student's t-test, *P<0.05, n≥3; Error bars indicate s.d. (e) Western blot of pure cartilage tissues harvested from long bone mice receiving rapamycin.

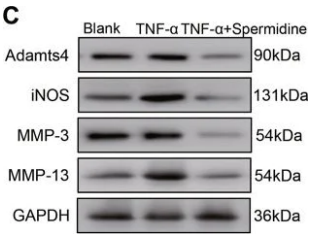


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Western blot - Anti-MMP13 antibody (ab39012)

MMP13 Western blot staining using rabbit Anti-MMP13 antibody

MMP13 western blotting using Anti-MMP13 antibody ab39012. Publication image and figure legend from Chen, Z., Lin, C. X., et al., 2020, Cell Death Dis, Pubmed 32632306.

Spermidine treatment inhibits TNF-a induced arthritis (TIA).a immunohistochemistry was used to assess the expression of TNF-α in synovial tissue of the knee joint after 4, 8, and 16 weeks of spermidine treatment to TNF-a induced arthritis mice. b TNF-α score was calculated based on IHC staining. c, d Western blot analysis of the expression of iNOS, MMP-3, MMP-13, and Adamts4 in FLS. e qRT-PCR analysis of the expression of IL-6, MMP-3, and MMP-13 in FLS. Data are shown as mean ± SD, n = 10, *p < < 0.05, **p < < 0.01, ***p < < 0.001, scale bar, 200 μm.

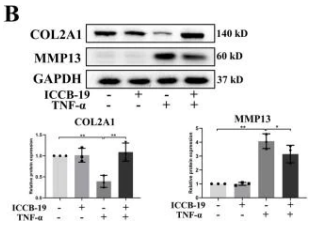


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Western blot - Anti-MMP13 antibody (ab39012)

MMP13 Western blot staining using rabbit Anti-MMP13 antibody

MMP13 western blotting using Anti-MMP13 antibody ab39012. Publication image and figure legend from Sun, K., Guo, Z., et al., 2023, Cell Death Discov, Pubmed 37002200.

The protective effects of ICCB-19 on chondrocytes.After a pre-treatment of ICCB-19 for 2 h, chondrocytes were stimulated by TNF-α for 24 h. A, B the protein expression of iNOS, COX2, COL2A1, and MMP13 were examined. C The semi-quantitative analysis of protein expression. D The apoptotic chondrocytes were stained by Annexin V-FITC /PI and analyzed by flow cytometry. The average apoptotic rates were shown in (E). F The apoptotic chondrocytes were labeled by TUNEL staining, scale bar: 50 μm. G After the indicated treatment, the phosphorylation of RIPK1, RIPK3, and MLKL as well as protein expression of these three markers were detected by western blot. H The semi-quantitative analysis of protein expression. I After the induction of necroptosis, the supernatant containing TNF-α and z-VAD was replaced by refresh culture medium. 24 h later, the culture medium was transferred to untreated primary chondrocytes and culture for 24 h. The protein expression of MMP13 and phosphorylation of MLKL were examined. J The semi-quantitative analysis of protein expression. Data are expressed as means ± SD. *p < < 0.05, **p < < 0.01. NS not significant. z-VAD, Z-VAD-FMK. P-, Phosphorylated-.

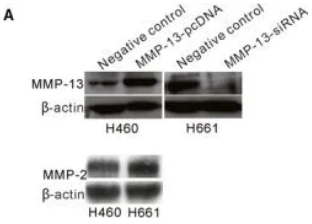


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Western blot - Anti-MMP13 antibody (ab39012)

MMP13 Western blot staining using rabbit Anti-MMP13 antibody

MMP13 western blotting using Anti-MMP13 antibody ab39012. Publication image and figure legend from Li, Y., Sun, B., et al., 2017, J Cell Mol Med, Pubmed 28766880.

Transfection of cells with MMP-13 and treatment with MMP-13 Ln-5 cleavage fragments disrupted VM formation (*p < < 0.05). (A) MMP-13 expression was successfully regulated by transfection plasmids. In H460 cells, MMP-13 was up-regulated by transfection with pcDNA-MMP-13 plasmids, and in H661 cells, MMP-13 was down-regulated by transfection with MMP-13-siRNA plasmids. Transfection efficiency was confirmed via WB. MMP-2 was highly expressed in both cell lines (B) Transfection of H460 cells with pcDNA-MMP-13 abrogated the capillary-like tube formation ability on Matrigel. However, knockdown of MMP-13 expression in H661 cells induced typical tube formation. (C) Exogenous addition of recombinant human MMP-13 proteins in the 3D culture medium resulted in the inability of H460 and H661 cells to form capillary-like tubes. In contrast, the exogenous addition of recombinant human MMP-2 proteins induced the cells to form more typical capillary-like tubes on the Matrigel. Exogenous addition of recombinant human Ln-5 protein induced the H460 cells to form more typical capillary-like tubes but not in H661 cells that overexpressed MMP-13. (D) Exogenous addition of Ln-5 cleaved by MMP-13 in the 3D culture medium resulted in the inability of H460 and H661 cells to form capillary-like tubes. In contrast,

the exogenous addition of the MMP-2 Ln-5 cleavage products induced the cells to form more typical capillary-like tubes. The addition of all three of these proteins also suppressed tube formation (Bar = 100 µm).

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