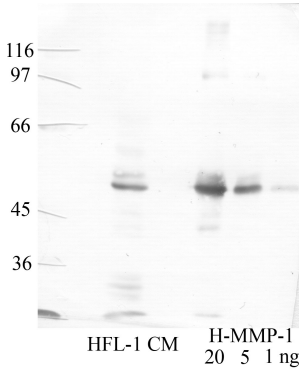
Anti-MMP1 Rabbit Polyclonal Antibody

Interstitial collagenase, EC 3.4.24.7, Fibroblast collagenase, Matrix metalloproteinase-1, MMP-1,

Gene: MMP1 **UniProt:** P03956 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



Carboxyterminal end
RP3MMP1

— Western Blot (1-panel validation)

Actual Western blot validation for anti-MMP1 rabbit polyclonal antibody. 1-panel validation across domain-specific antibody clones — each panel labeled with its catalog number and target domain. Reducing conditions; 10–20 µg/lane on 7.5–10% SDS-PAGE.

Key Product Facts

Supplier	Triple Point Biologics, Inc. (Sudbury, Ontario, Canada)
Product Name	Anti-MMP1 Rabbit Polyclonal Antibody
Gene Symbol	MMP1
Alternative Names	Interstitial collagenase, EC 3.4.24.7, Fibroblast collagenase, Matrix metalloproteinase-1, MMP-1,
UniProt ID	P03956
Host Species	Rabbit
Clonality	Polyclonal (pAb)
Isotype	IgG
Concentration	1mg/ml
Purity	Affinity purified
Pack Size	100ug
Validated Application	WB
Recommended Dilution	WB-1/1000
Species Reactivity	Validated- Human Potential-Rat, Pan, Monkey, Dog, Pig
Immunogen Type	Synthetic Peptide from Uniprot Sequence
Conjugation	none
Buffer / Preservatives	Sodium Chloride 500 mM, Sodium Phosphate 10 mM, Potassium Phosphate 1.8 mM, Potassium Chloride 2.7 mM, Glycerol 50% (v/v)
Website	triplepointbiologics.com/anti-mmp-1-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of MMP1. Each variant is directed at a specific structural region of the protein. Exact peptide sequences are proprietary; each variant is validated for the applications listed.

Domain / Variant	Epitope Region (approx. residues)	Cat. No.	Availability

Hemopexin domain	**269–469** Region spanning the C-terminal hemopexin-like domain of human MMP-1, a four-bladed β-propeller structure connected to the catalytic domain via the proline-rich hinge; this domain is required for triple-helical collagen binding, unwinding, and productive cleavage	RP1MMP1	In catalog
Hinge Region	**250–274** Region encompassing the short proline-rich linker (hinge) of human MMP-1 that connects the catalytic domain to the hemopexin-like domain, conferring the conformational flexibility required for collagenolytic activity	RP2MMP1	In catalog
Carboxyterminal end	**419–469** Region at the extreme C-terminal end of the hemopexin-like domain of human MMP-1, within the fourth blade of the β-propeller structure, distal to the hinge region	RP3MMP1	In catalog
Â Aminoterminal end of active enzyme	**100–150** Region at the N-terminal end of the catalytic domain of human MMP-1, immediately downstream of the propeptide cleavage site, corresponding to the newly exposed N-terminus generated upon zymogen activation	RP4MMP1	In catalog
Propeptide region	**20–99** Region within the N-terminal propeptide of human MMP-1, which maintains latency via the cysteine-switch mechanism; this domain is removed upon proteolytic activation and is absent in the mature active enzyme	RP5MMP1	In catalog
Native MMP-1	**~20–469** Antibody raised against native, folded full-length human MMP-1 (proenzyme form), spanning multiple conformational epitopes across the propeptide, catalytic, hinge, and hemopexin-like domains	MABMMP1	In catalog
—	**100–469** Reagent spanning multiple domains of human MMP-1, encompassing the propeptide, catalytic domain, hinge region, and hemopexin-like domain, suitable for broad detection of both pro- and active enzyme forms	RP-MMP1	In catalog
Aminoterminal end active Xenopus MMP-18	**100–150** Region at the N-terminal end of the catalytic domain of Xenopus MMP-18 (collagenase-4), immediately downstream of the propeptide cleavage site, analogous to the activation-generated N-terminus of other collagenase sub-group members	RP1MMP18	In catalog

Hinge region Xenopus MMP-18	**250–274** Region encompassing the proline-rich linker (hinge) of Xenopus MMP-18 that connects the catalytic domain to the hemopexin-like domain, structurally analogous to the hinge region of human MMP-1 and other collagenase family members	RP2MMP18	In catalog
Carboxytermianl region Xenopus MMP-18	**419–469** Region within the C-terminal portion of the hemopexin-like domain of Xenopus MMP-18, located in the distal blades of the β-propeller structure, downstream of the hinge and analogous to the C-terminal hemopexin region of human MMP-1	RP3MMP18	In catalog
—	**100–469** Reagent spanning multiple domains of Xenopus MMP-18, encompassing the propeptide, catalytic domain, hinge region, and hemopexin-like domain, suitable for broad detection of both pro- and active forms of this collagenase sub-group member	RP-MMP18	In catalog
Native MMP-1	Full-length recombinant human protein	RHMMP1	In catalog

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
WB	Validated-Human Potential-Rat, Pan, Monkey, Dog, Pig	1:1000	Optimal dilution should be determined per laboratory and lot.

Optimal dilutions should be determined by each laboratory for each application. Triple Point Biologics antibodies include a peptide-neutralized negative control aliquot for specific-signal confirmation.

Storage & Handling

Short-term Storage	+4°C (1–2 weeks)
Long-term Storage	Aliquot and store at -20°C
Shipping Conditions	Shipped in styrofoam cooler on blue ice
Hazard Warning	Product may contain Sodium Azide — POISONOUS AND HAZARDOUS. Handle by trained personnel only.
Shelf Life	12 months from date of receipt under recommended conditions

Target Background

Family & General Biology

Matrix metalloproteinase-1 (MMP-1, EC 3.4.24.7), also designated interstitial collagenase or fibroblast collagenase, is the prototypical member of the MMP family of zinc- and calcium-dependent endopeptidases. It was the first mammalian collagenase characterised and remains the reference point for the collagenase sub-group (MMP-1, -8, -13, -18). The 469-amino acid precursor (UniProt P03956) contains a signal peptide, an N-terminal propeptide, a catalytic domain harbouring the zinc-binding HEXXH motif, a short proline-rich hinge region, and a C-terminal hemopexin-like domain. All five modules are required for full biological function.

Expression & Localisation

MMP-1 is expressed by a broad range of cell types, including dermal fibroblasts, keratinocytes, macrophages, endothelial cells, smooth muscle cells, chondrocytes, and epithelial tumour cells. Expression is largely absent in healthy resting tissue but is strongly induced by pro-inflammatory cytokines (IL-1β, TNF-α), growth factors (EGF, bFGF), phorbol esters, and cell-matrix interactions mediated through integrins. MMP-1 is secreted into the extracellular space, where it can associate with the cell surface or remain soluble in the pericellular environment. Transcript levels are regulated principally at the transcriptional level through AP-1 and NF-κB response elements in the MMP1 promoter.

Activation Mechanism

MMP-1 is secreted as an inactive zymogen. Latency is maintained by a cysteine-switch mechanism in which a conserved cysteine residue in the propeptide coordinates the catalytic zinc ion, blocking substrate access. Disruption of this interaction — by organomercurial compounds, reactive oxygen species, or proteolytic cleavage — initiates a stepwise autoactivation cascade. In vivo, plasmin, plasma kallikrein, trypsin, and other MMPs (notably MMP-3/stromelysin-1) can cleave and activate pro-MMP-1. Full activation requires removal of the entire propeptide, generating the ~42 kDa active form from the ~52 kDa proenzyme.

Key Substrates

The defining substrate of MMP-1 is the fibrillar interstitial collagen triple helix. MMP-1 cleaves types I, II, and III collagen at a single Gly-Ile/Leu bond within the helical domain, producing characteristic ¾ and ¼ fragments that spontaneously denature at body temperature and become susceptible to further proteolysis by gelatinases. Additional substrates include types VII and X collagen, aggrecan, versican, serpins, and the secreted HIV-1 Tat protein. The hemopexin domain is obligatory for triple-helix unwinding and productive collagen cleavage, distinguishing MMP-1 mechanistically from non-collagenolytic MMPs.

Inhibitor Profile

MMP-1 activity is regulated endogenously by the four tissue inhibitors of metalloproteinases (TIMP-1, -2, -3, -4), which bind in a 1:1 stoichiometric, tight-binding, reversible manner to both proenzyme and active forms. TIMP-1 is the primary physiological inhibitor in most tissue contexts. α2-macroglobulin traps active MMP-1 in the circulation. Synthetic hydroxamate-based broad-spectrum MMP inhibitors (e.g., GM6001/ilomastat, marimastat) and the more selective compound FN-439 chelate the active-site zinc and inhibit MMP-1 at nanomolar concentrations. Imbalance between MMP-1 and TIMP expression is a recognised driver of fibrotic and neoplastic disease.

Disease Relevance

Dysregulated MMP-1 expression is associated with a wide spectrum of pathological conditions. In inflammatory arthritis, excess MMP-1 drives cartilage and bone destruction; elevated synovial fluid levels correlate with disease activity in rheumatoid arthritis. In oncology, MMP-1 promotes tumour invasion, angiogenesis, and metastatic dissemination through stromal collagen degradation and processing of bioactive matrix fragments. Elevated MMP-1 is documented in colorectal, breast, lung, and gastric carcinomas. In skin and pulmonary fibrosis, chronic MMP-1 dysregulation disrupts normal tissue architecture. A functional promoter polymorphism (1G/2G at –1607) that modulates MMP1 transcription has been linked to altered cancer susceptibility and wound-healing capacity.

Gene & Protein Reference

Gene Symbol	MMP1
HGNC	HGNC:7155
NCBI Gene ID (Human)	4312
NCBI Gene ID (Mouse)	83995
Ensembl	ENSG00000196611
OMIM	120353
UniProt (Human)	P03956
UniProt (Mouse)	P04187
Protein Family	Peptidase M10A (Matrixin) family; Collagenase sub-group
Predicted MW	~54 kDa (proenzyme); ~42 kDa (active form)
Observed MW	~52–57 kDa (pro-form) and ~42–45 kDa (active form) on SDS-PAGE, depending on glycosylation state
Chromosome	11q22.2
Paralogue	MMP-8 (neutrophil collagenase), MMP-13 (collagenase-3), MMP-18 (Xenopus collagenase-4)
Key Substrates	Collagens I, II, III (primary triple-helical cleavage); Collagens VII, X; aggrecan; versican; HIV-1 Tat
Activated by	MMP-3 (stromelysin-1), plasmin, plasma kallikrein, trypsin; autocatalytic activation following cysteine-switch disruption by APMA or ROS
Inhibited by	TIMP-1 (primary), TIMP-2, TIMP-3, TIMP-4; α2-macroglobulin; hydroxamate inhibitors (GM6001, marimastat); FN-439

About Triple Point Biologics

With over 30 years dedicated to antibody production, Triple Point Biologics is a Canadian company and the premier resource for proteinase and proteinase inhibitor research. Products have been cited in thousands of peer-reviewed publications.

The domain-specific antibody strategy — available in standard, ATK, SPA, and GSK kit formats — delivers predefined epitopes, built-in peptide-neutralized negative controls, and superior specificity for Western blot.

Website: www.triplepointbiologics.com

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