Anti-TIMP1 Rabbit Polyclonal Antibody

Metalloproteinase inhibitor 1, Erythroid-potentiating activity, EPA, Fibroblast collagenase inhibitor, Collagenase inhibitor, Tissue inhibitor of metalloproteinases 1, TIMP-1,

Gene: TIMP1 **UniProt:** P01033 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image

Image placeholder — Western Blot

— Western Blot

Suggested image: Western blot of relevant cell or tissue lysates under reducing conditions, probed with the domain-specific antibody. Include a positive-control lane and empty-vector or knockout negative control. Loading: 10–20 µg/lane on 7.5–10% SDS-PAGE.

Key Product Facts

Supplier	Triple Point Biologics, Inc. (Sudbury, Ontario, Canada)
Product Name	Anti-TIMP1 Rabbit Polyclonal Antibody
Gene Symbol	TIMP1
Alternative Names	Metalloproteinase inhibitor 1, Erythroid-potentiating activity, EPA, Fibroblast collagenase inhibitor, Collagenase inhibitor, Tissue inhibitor of metalloproteinases 1, TIMP-1,
UniProt ID	P01033
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
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-timp-1-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of TIMP1. 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

Loop #3	**~97–120** Region spanning the third exposed surface loop of the TIMP-1 N-terminal inhibitory domain, located between the second and third conserved disulfide bonds (Cys99 and Cys124 region), on the face of the wedge-shaped inhibitory ridge distal from the MMP active-site contact residues	RP1TIMP1	In catalog
Loop #1 and Loop #2	**~1–70** Region encompassing the first two surface-exposed loops of the TIMP-1 N-terminal domain, including the reactive-site N-terminal edge (anchored by Cys1–Cys70) that makes primary contact with the MMP catalytic cleft and the adjacent loop that contributes to zinc coordination and substrate-blocking activity	RP2TIMP1	In catalog
Carboxyterminal region	**157–207** Region within the C-terminal sub-domain of TIMP-1, spanning residues beyond the N-domain/C-domain linker; this region mediates binding to pro-MMP-9 and to the cell-surface receptor CD63, underpinning MMP-inhibition-independent anti-apoptotic signalling	RP3TIMP1	In catalog
Loop #1	**~1–40** Region comprising the first reactive-site loop of the TIMP-1 N-terminal domain, which contributes the α-amino group of Cys1 for catalytic zinc coordination within the MMP active site and forms the principal contact edge of the inhibitory wedge	RP4TIMP1	In catalog
Native human TIMP-1	**~1–207** Full-length native human TIMP-1 protein used as immunogen; the antibody therefore has the potential to recognise conformational and linear epitopes distributed across both the N-terminal inhibitory domain and the C-terminal domain of the intact glycoprotein	MABTIMP1	In catalog
—	**24–207** Recombinant antigen spanning both the N-terminal inhibitory domain and the C-terminal domain of human TIMP-1, providing epitope coverage across the full-length mature protein for broad cross-reactivity across multiple structural regions	RP-TIMP1	In catalog

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
WB	Validated-Human Potential	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

TIMP-1 is a member of the four-protein TIMP family (TIMP-1 through TIMP-4), which collectively constitute the principal endogenous brake on matrix metalloproteinase (MMP) activity in vertebrate tissues. All TIMPs share a conserved two-domain architecture: an N-terminal inhibitory domain and a C-terminal domain that mediates MMP-independent protein–protein interactions. TIMP-1 was first described as a secreted glycoprotein with erythroid-potentiating activity (EPA) and separately as a fibroblast collagenase inhibitor before these activities were unified in a single 207-amino-acid polypeptide encoded by the TIMP1 gene on chromosome Xp11.3.

Expression & Localisation

TIMP-1 is expressed broadly across tissues, with particularly high levels in liver, kidney, ovary, uterus, and skin fibroblasts. Expression is inducible by a range of mediators including cytokines (IL-1, TGF-β, oncostatin M), growth factors (EGF, FGF), phorbol esters, and serum. The protein is constitutively secreted into the extracellular space and detectable in plasma, urine, synovial fluid, and cerebrospinal fluid under both homeostatic and pathological conditions. Intracellularly, TIMP-1 associates with pro-MMP-9 within secretory granules of neutrophils, facilitating co-secretion of a latent MMP-9/TIMP-1 complex.

Inhibitory Mechanism

TIMP-1 inhibits MMPs through a tight, non-covalent 1:1 interaction that is effectively irreversible under physiological conditions (Ki in the sub-picomolar to low-nanomolar range). The N-terminal domain inserts into the MMP active-site cleft, where the α-amino group of Cys1 coordinates the catalytic zinc ion, displacing the prodomain cysteine-switch and blocking substrate access. The reactive-site ridge of TIMP-1 is stabilised by three conserved disulfide bonds within the N-domain (Cys1–Cys70, Cys3–Cys99, Cys13–Cys124). TIMP-1 inhibits MMP-1, -2, -3, -7, -8, -9, -10, -11, -12, -13, and -16, but is a poor inhibitor of membrane-anchored MMP-14 (MT1-MMP).

MMP-Independent Signalling

Beyond direct MMP inhibition, TIMP-1 engages cell-surface receptors to modulate intracellular signalling. It binds CD63, a tetraspanin, in concert with integrin β1 to activate the PI3K/Akt survival pathway, suppressing apoptosis in mammary epithelial cells and certain tumour lines. TIMP-1 also promotes cell proliferation via activation of the FAK/Src and MAPK/ERK cascades downstream of CD63 engagement. These MMP-inhibition-independent functions are structurally separable: the C-terminal domain of TIMP-1 is sufficient for CD63 binding, whereas the N-terminal domain carries full inhibitory activity.

Disease Relevance

Dysregulated TIMP-1 expression is documented across a wide spectrum of pathologies. Elevated circulating TIMP-1 is an independent prognostic marker in colorectal, breast, lung, and haematological malignancies, where its anti-apoptotic signalling is proposed to favour tumour cell survival despite its ostensible MMP-inhibitory role. In fibrotic disease — hepatic fibrosis, idiopathic pulmonary fibrosis, cardiac fibrosis — persistently elevated TIMP-1 shifts the MMP/TIMP balance toward net matrix accumulation, driving scar formation. Conversely, TIMP-1 deficiency in animal models exacerbates inflammatory joint destruction and aortic aneurysm progression, underscoring context-dependent protective functions.

Key Substrates & Interactors

Because TIMP-1 acts as an inhibitor rather than an enzyme, its 'substrates' are best defined as the MMPs whose proteolytic activities it neutralises. Historically most studied are the collagenases MMP-1 and MMP-13, the gelatinases MMP-2 and MMP-9, and the stromelysins MMP-3 and MMP-10. TIMP-1 also forms a stable latent complex with pro-MMP-9 via C-terminal domain contacts, sequestering the zymogen. The erythroid-potentiating activity, distinct from MMP inhibition, is species-selective and mediated through interactions with progenitor cell surface receptors, highlighting that TIMP-1 occupies a dual role as both a proteinase brake and an extracellular signalling molecule.

Gene & Protein Reference

Gene Symbol	TIMP1
HGNC	11820
NCBI Gene ID (Human)	7076
NCBI Gene ID (Mouse)	21857
Ensembl	ENSG00000102265
OMIM	305370
UniProt (Human)	P01033
UniProt (Mouse)	P12032
Protein Family	TIMP family (TIMP-1 through TIMP-4)
Predicted MW	23 kDa (unglycosylated polypeptide)
Observed MW	28–32 kDa (glycosylated, by SDS-PAGE)
Chromosome	Xp11.3
Paralogue	TIMP-2 (TIMP2), TIMP-3 (TIMP3), TIMP-4 (TIMP4)
Key Substrates	MMP-1, MMP-2, MMP-3, MMP-7, MMP-8, MMP-9, MMP-10, MMP-11, MMP-12, MMP-13, MMP-16 (inhibited); MMP-14 (MT1-MMP) is not effectively inhibited
Activated by	IL-1, TGF-β, oncostatin M, EGF, FGF, phorbol esters, serum; expression is transcriptionally induced by these stimuli

Inhibited by	No classical enzymatic activity (TIMP-1 is a proteinase inhibitor, not an enzyme); TIMP-1 protein activity is modulated by pro-domain interactions and C-terminal domain contacts with pro-MMP-9

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