Anti-TIMP2 Rabbit Polyclonal Antibody

Metalloproteinase inhibitor 2, CSC-21K, Tissue inhibitor of metalloproteinases 2, TIMP-2,

Gene: TIMP2 **UniProt:** P16035 **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-TIMP2 Rabbit Polyclonal Antibody
Gene Symbol	TIMP2
Alternative Names	Metalloproteinase inhibitor 2, CSC-21K, Tissue inhibitor of metalloproteinases 2, TIMP-2,
UniProt ID	P16035
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-2-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of TIMP2. 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

Carboxyterminal region	**170–220** Region within the independently folded C-terminal domain of human TIMP-2, which mediates binding to the hemopexin-like domain of pro-MMP-2 and participates in the ternary complex required for cell-surface MMP-2 activation via MMP-14	RP1TIMP2	In catalog
Loop #1	**~1–30** Region encompassing the first reactive loop of the N-terminal inhibitory domain of human TIMP-2, including the N-terminal cysteine that coordinates the catalytic zinc ion of target MMPs and forms part of the primary MMP-contact ridge	RP2TIMP2	In catalog
Loop #3	**~68–100** Region corresponding to the third surface-exposed loop of the N-terminal beta-barrel scaffold of human TIMP-2, positioned distal to the primary zinc-coordinating residues but contributing to the MMP active-site contact surface and overall inhibitory ridge geometry	RP3TIMP2	In catalog
Loop #2	**~40–67** Region spanning the second protruding loop of the N-terminal inhibitory domain of human TIMP-2, located between Loop #1 and Loop #3 on the beta-barrel scaffold, forming part of the extended reactive ridge that engages the MMP active-site cleft	RP4TIMP2	In catalog
—	**27–220** Broad-coverage immunogen spanning both the N-terminal MMP-inhibitory domain and the C-terminal hemopexin-binding domain of human TIMP-2, suitable for detection of total TIMP-2 protein across a range of tissue and cellular contexts without restriction to a single structural epitope	RP-TIMP2	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

Tissue inhibitor of metalloproteinases 2 (TIMP-2, UniProt P16035) is a member of the four-protein TIMP family (TIMP-1 through TIMP-4) that serves as the principal endogenous inhibitor of matrix metalloproteinases (MMPs). TIMP-2 is a secreted, 220-amino acid glycoprotein of approximately 21 kDa (unglycosylated) whose tertiary structure is stabilised by six conserved disulfide bonds. The protein folds into two structurally distinct domains: an N-terminal inhibitory domain (~126 residues) and a C-terminal domain (~94 residues), each stabilised by three disulfide bridges. This two-domain architecture underpins the dual functionality that distinguishes TIMP-2 from other family members.

Expression & Localisation

Unlike TIMP-1, which is broadly inducible by cytokines and growth factors during inflammation, TIMP-2 is constitutively expressed in the majority of adult tissues and cell types, including fibroblasts, endothelial cells, smooth muscle cells, and epithelial cells. This widespread, relatively stable expression pattern reflects a homeostatic role in maintaining baseline control of extracellular matrix (ECM) turnover. TIMP-2 is secreted into the extracellular space and is detectable in plasma and various biological fluids. At the cell surface, TIMP-2 associates with membrane-type MMPs, particularly MMP-14, tethering it to a pericellular compartment relevant to pro-MMP-2 activation.

MMP Inhibition Mechanism

TIMP-2 inhibits MMP catalytic activity through a mechanism in which the N-terminal domain inserts into the MMP active-site cleft, coordinating the catalytic zinc ion and displacing substrate. The N-terminal cysteine (Cys1) plays a central role in this interaction; its free amino group chelates zinc, forming a tight-binding, reversible complex with inhibition constants (Ki) in the picomolar range for several MMPs. TIMP-2 inhibits a broad spectrum of MMPs, including MMP-1, MMP-2, MMP-3, MMP-7, MMP-8, MMP-9, MMP-10, MMP-13, MMP-14, MMP-15, and MMP-16, making it one of the least selective inhibitors within the TIMP family.

Paradoxical Role in Pro-MMP-2 Activation

A defining feature of TIMP-2 biology is its concentration-dependent, paradoxical participation in MMP-2 activation at the cell surface. At low concentrations, TIMP-2 bridges pro-MMP-2 and MMP-14 by engaging the C-terminal hemopexin domain of pro-MMP-2 with its own C-terminal domain, while simultaneously binding MMP-14 via its N-terminal domain. This ternary complex positions pro-MMP-2 for cleavage by an adjacent, uninhibited MMP-14 molecule, generating active MMP-2. At high concentrations, excess TIMP-2 saturates MMP-14 and suppresses activation. This switch between activating and inhibiting roles is concentration-sensitive and has functional consequences for pericellular proteolysis and ECM remodelling.

Disease Relevance

The MMP/TIMP axis is dysregulated across a wide range of pathologies. In cancer, reduced TIMP-2 expression or activity correlates with increased tumour invasiveness, basement membrane degradation, and metastatic potential, though context-dependent tumour-suppressive and tumour-promoting roles have both been documented. In cardiovascular disease,

TIMP-2 modulates myocardial remodelling and aortic aneurysm progression. In fibrotic conditions, the balance between TIMP-2-mediated MMP inhibition and collagen deposition determines the extent of tissue scarring. TIMP-2 also participates in angiogenesis regulation, where MMP-2 activity governs endothelial cell migration and vascular remodelling.

Structural Domains & Epitope Accessibility

The N-terminal domain of TIMP-2 (approximately residues 1–126) contains the MMP-inhibitory surface including the reactive ridge formed by loops connecting the core beta-barrel scaffold. Three discrete loops — commonly designated Loop #1, Loop #2, and Loop #3 — protrude from this scaffold and contact the MMP active site, making them immunologically accessible but functionally critical regions. The C-terminal domain (approximately residues 127–220) folds independently and mediates interactions with the hemopexin domains of latent MMPs, particularly pro-MMP-2. Antibodies targeting distinct structural regions of TIMP-2 are therefore valuable for mapping functional epitopes, assessing protein conformation, and detecting TIMP-2 in complex biological matrices.

Gene & Protein Reference

Gene Symbol	TIMP2
HGNC	11820
NCBI Gene ID (Human)	7077
NCBI Gene ID (Mouse)	21858
Ensembl	ENSG00000035862
OMIM	188825
UniProt (Human)	P16035
UniProt (Mouse)	P25325
Protein Family	TIMP family (TIMP-1, TIMP-2, TIMP-3, TIMP-4)
Predicted MW	~21 kDa (unglycosylated); ~24 kDa (glycosylated)
Observed MW	~21–24 kDa by SDS-PAGE (glycosylation-dependent)
Chromosome	17q25.3 (human)
Paralogue	TIMP-1, TIMP-3, TIMP-4
Key Substrates	Not a proteinase; inhibits MMP-1, MMP-2, MMP-3, MMP-7, MMP-8, MMP-9, MMP-10, MMP-13, MMP-14, MMP-15, MMP-16
Activated by	Not applicable (endogenous inhibitor; secreted in active form)
Inhibited by	Not applicable at the protein level; TIMP-2 expression is regulated transcriptionally by TGF-β, retinoic acid, and cell-cell contact signals

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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Product specifications subject to change. Contact Triple Point Biologics for current product and availability information.