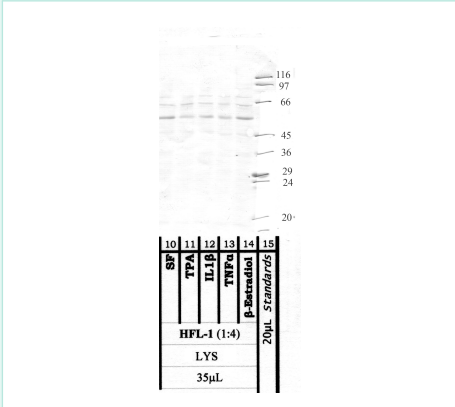


Anti-MMP21 Rabbit Polyclonal Antibody

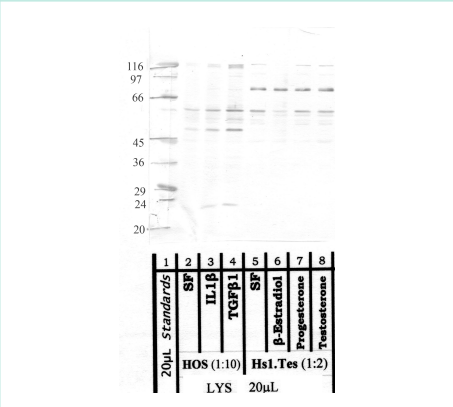
Matrix metalloproteinase-21, MMP-21, EC 3.4.24.-,

Gene: MMP21 UniProt: Q8N119 Host: Rabbit Clonality: Polyclonal (pAb)

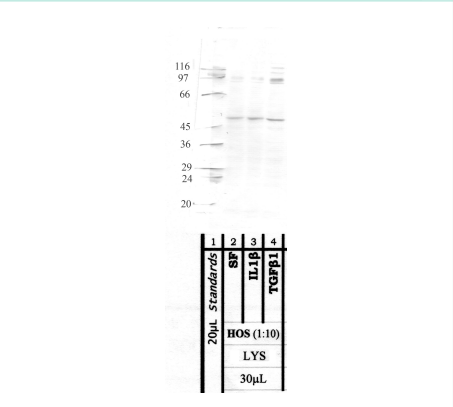
Product Image



Propeptide domain Xenopus MMP-21
RP1MMP21



Propeptide domain human MMP-21
RP1MMP21H



Aminoterminal end of active Xenopus
MMP-21
RP2MMP21

— Western Blot (6-panel validation across domain-specific antibody clones)

Actual Western blot validation for anti-MMP21 rabbit polyclonal antibody. 6-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-MMP21 Rabbit Polyclonal Antibody
Gene Symbol	MMP21
Alternative Names	Matrix metalloproteinase-21, MMP-21, EC 3.4.24.-,
UniProt ID	Q8N119
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-Mouse, Rat, Pan, Monkey, Dog
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-21-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of MMP21. 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
------------------	-----------------------------------	----------	--------------

Propeptide domain Xenopus MMP-21	25–144 Region within the propeptide domain of Xenopus MMP-21, encompassing the cysteine-switch motif that coordinates the catalytic zinc ion and maintains zymogen latency, located between the signal peptide cleavage site and the catalytic domain boundary	RP1MMP21	In catalog
Aminoterminal end of active Xenopus MMP-21	145–195 Region spanning the amino-terminal portion of the catalytic domain of Xenopus MMP-21, immediately downstream of the propeptide cleavage site and encompassing the start of the active-enzyme sequence including conserved zinc-binding motif flanking residues	RP2MMP21	In catalog
Hinge region Xenopus MMP-21	305–329 Region corresponding to the proline-rich hinge (linker) segment of Xenopus MMP-21, connecting the catalytic domain to the C-terminal hemopexin-like domain, a flexible interdomain region with limited secondary structure	RP3MMP21	In catalog
Carboxyterminal end Xenopus MMP-21	519–569 Region within the C-terminal hemopexin-like domain of Xenopus MMP-21, toward the distal blade of the four-bladed beta-propeller structure, a region implicated in protein–protein interactions and cellular localization	RP4MMP21	In catalog
—	145–569 Broad multi-domain immunogen spanning propeptide through hemopexin-like domain of Xenopus MMP-21, providing polyclonal responses against epitopes distributed across the major structural regions of the full-length precursor protein	RP-MMP21	In catalog
Propeptide domain human MMP-21	25–144 Region within the propeptide domain of human MMP-21 (UniProt Q8N119), encompassing the conserved cysteine-switch motif that coordinates the catalytic zinc and maintains latency, bounded by the signal peptide cleavage site and the furin-recognition/activation site	RP1MMP21H	In catalog
Aminoterminal end of active HUMAN MMP-21	145–195 Region spanning the amino-terminal portion of the human MMP-21 catalytic domain, immediately C-terminal to the propeptide/activation cleavage site and encompassing conserved structural elements of the active-site cleft including residues flanking the zinc-coordinating HEXXHXXGXXH motif	RP2MMP21H	In catalog

—	145–569 Broad multi-domain immunogen spanning propeptide through hemopexin-like domain of human MMP-21 (UniProt Q8N119), generating polyclonal responses against epitopes distributed across the principal structural regions of the 569-amino-acid full-length precursor	RP-MMP21H	In catalog
---	---	-----------	------------

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
WB	Validated-Human Potential-Mouse, Rat, Pan, Monkey, Dog	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

General Biology and Family Context

Matrix metalloproteinase-21 (MMP-21) is a secreted, zinc-dependent endopeptidase belonging to the metzincin superfamily of metalloproteinases. It shares the canonical MMP domain architecture — signal peptide, propeptide, catalytic domain, hinge region, and hemopexin-like domain — yet occupies a functionally distinct niche within the family. Unlike the majority of MMPs whose primary roles center on extracellular matrix remodeling in tissue homeostasis and inflammation, MMP-21 has a comparatively restricted and specialized physiological function, most clearly defined in the context of vertebrate embryonic development.

Expression Profile

MMP-21 expression is most prominent during early embryogenesis, particularly at stages when left-right axis patterning is being established. In adult human tissues, expression is relatively low and tissue-restricted compared with broadly expressed family members such as MMP-2 or MMP-9. Elevated MMP-21 transcript and protein levels have been detected in certain epithelial malignancies, suggesting that the developmental expression program may be re-activated or dysregulated in a subset of cancers. The secreted nature of the mature enzyme means detection in conditioned media and extracellular compartments is expected alongside intracellular precursor forms.

Activation Mechanism

Like other MMPs, MMP-21 is synthesized as a latent zymogen in which the propeptide cysteine coordinates the catalytic zinc ion, maintaining enzymatic inactivity — the so-called 'cysteine-switch' mechanism. Proteolytic removal of the propeptide, either by furin-type proprotein convertases at a conserved RXXR motif or by other extracellular proteinases, liberates the active catalytic domain. The full-length human protein is 569 amino acids. Following signal peptide cleavage and propeptide removal, the predicted molecular weight of the mature enzyme is approximately 45–48 kDa, though observed migration on SDS-PAGE can differ due to glycosylation.

Key Substrates and Signaling Roles

The most clearly documented substrate of MMP-21 is alpha-1-antitrypsin (SERPINA1), a serine proteinase inhibitor, indicating that MMP-21 can modulate proteinase inhibitor activity in the pericellular environment. Critically, MMP-21 functions as a negative regulator of NOTCH signaling during vertebrate left-right axis specification. In Xenopus and zebrafish models, MMP-21 activity is required for correct lateralization of asymmetrically expressed genes, and perturbation of MMP-21 function disrupts normal NOTCH-dependent asymmetric gene expression cascades that determine organ situs.

Disease Relevance: Heterotaxy and Congenital Heart Disease

Recessive loss-of-function mutations in MMP21 have been identified in patients with heterotaxy syndrome, a clinically and genetically heterogeneous condition defined by randomized or mirror-image arrangement of thoracoabdominal organs. Associated cardiac defects — including transposition of the great arteries, isomerism, and complex univentricular anatomy — can be severe. MMP21 thus represents one of the few MMP family members directly linked to a Mendelian developmental disorder, distinguishing it from MMPs primarily implicated in acquired diseases such as fibrosis or cancer invasion.

Research Applications and Reagent Considerations

Researchers investigating left-right patterning, NOTCH pathway biology, congenital heart disease genetics, and proteinase inhibitor networks routinely need to detect and localize MMP-21 by Western blot, immunohistochemistry, and immunofluorescence. Given that much of the foundational biology was established in Xenopus laevis and zebrafish models before being extended to human genetics, antibody cross-reactivity to amphibian orthologues is a practical consideration. Triple Point Biologics offers variants raised against both Xenopus and human MMP-21 epitopes to support studies across model organism and human tissue contexts.

Gene & Protein Reference

Gene Symbol	MMP21
HGNC	HGNC:14357
NCBI Gene ID (Human)	128866
NCBI Gene ID (Mouse)	214498
Ensembl	ENSG00000154485
OMIM	608416

UniProt (Human)	Q8N119
UniProt (Mouse)	Q8BZ98
Protein Family	Matrix metalloproteinase (MMP) family; metzincin superfamily; secreted MMP subgroup
Predicted MW	~63 kDa (full-length precursor); ~45–48 kDa (mature, after signal peptide and propeptide removal)
Observed MW	~60–65 kDa (pro-form on SDS-PAGE); ~45–50 kDa (active form); apparent MW may shift with glycosylation
Chromosome	10q26.13 (human)
Parologue	Closest structural paralogues include MMP-28 and MMP-19 within the secreted MMP subgroup
Key Substrates	Alpha-1-antitrypsin (SERPINA1); extracellular matrix components (broader substrate profile under investigation)
Activated by	Furin-type proprotein convertases (RXXR motif-dependent intracellular activation); extracellular proteinases (cysteine-switch mechanism)
Inhibited by	Tissue inhibitors of metalloproteinases (TIMPs); broad-spectrum MMP inhibitors (e.g., GM6001/ilomastat); chelation of catalytic zinc ion

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

FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES.

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