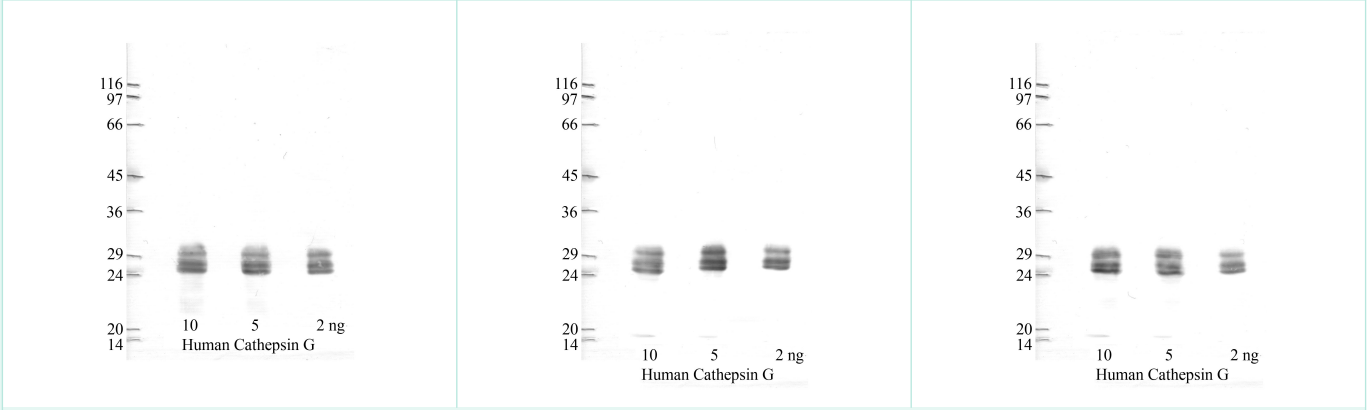
Anti-CTSG Rabbit Polyclonal Antibody

Cathepsin G, CG, EC 3.4.21.20,

Gene: CTSG **UniProt:** P08311 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



propeptide and amino end of active enzyme
RP1CathepsinG

Catalytic domain
RP2CathepsinG

carboxy end of the catalytic domain
RP3CathepsinG

— Western Blot (3-panel validation across domain-specific antibody clones)

Actual Western blot validation for anti-CTSG rabbit polyclonal antibody. 3-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-CTSG Rabbit Polyclonal Antibody
Gene Symbol	CTSG
Alternative Names	Cathepsin G, CG, EC 3.4.21.20,
UniProt ID	P08311
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, Pan, Monkey
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-cathepsin-g-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CTSG. 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 and amino end of active enzyme	**19–20** Region spanning the N-terminal signal peptide, the short activation propeptide, and the extreme amino-terminal portion of the mature active enzyme (A-chain), upstream of the first structural beta-barrel domain of the chymotrypsin fold; this region is processed and removed or remodelled during zymogen activation by cathepsin C	RP1Cathepsin G	In catalog
catalytic domain	**21–243** Region encompassing the central catalytic domain of mature Cathepsin G, including the canonical chymotrypsin-fold beta-barrel scaffold that houses the Ser-His-Asp catalytic triad and the S1 substrate-binding pocket responsible for the enzyme's dual chymotrypsin- and trypsin-like specificity	RP2Cathepsin G	In catalog
carboxy end of the catalytic domain	**203–243** Region at the C-terminal portion of the Cathepsin G catalytic domain, encompassing the second beta-barrel sub-domain of the chymotrypsin fold and including structural elements that contribute to substrate-binding site architecture and the surface loops implicated in inhibitor (serpin) engagement	RP3Cathepsin G	In catalog
—	**21–243** Broad-coverage antigen spanning the full-length Cathepsin G preproprotein sequence, encompassing the signal peptide, activation propeptide, and the entire mature catalytic domain; antibodies raised against this region recognise multiple epitopes distributed across the protein and are suitable for general detection applications	RP-CathepsinG	In catalog

Applications & Recommended Dilutions

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

Cathepsin G (CTSG; EC 3.4.21.20; UniProt P08311) is a chymotrypsin-fold serine protease of the S1 peptidase family, closely related to neutrophil elastase (ELANE), proteinase 3 (PRTN3), and azurocidin (AZU1). The mature enzyme exhibits dual substrate specificity, cleaving peptide bonds after bulky hydrophobic residues (Phe, Tyr, Trp, Leu; chymotrypsin-like) as well as after basic residues (Arg, Lys; trypsin-like), a breadth of specificity that is unusual among serine proteases. This dual specificity is encoded in the architecture of the S1 pocket and is relevant to the wide range of physiological substrates the enzyme processes in vivo.

Expression & Subcellular Localisation

CTSG expression is essentially restricted to myeloid cells, with highest levels in bone-marrow promyelocytes, where the proenzyme is synthesised and co-packaged with other granule-associated proteases into azurophilic (primary) granules of neutrophils and into secretory granules of mast cells. Mature circulating neutrophils do not actively transcribe CTSG; protein levels therefore reflect granule stores acquired during granulopoiesis. Upon neutrophil activation or degranulation, Cathepsin G is rapidly externalised to the pericellular space or the extracellular matrix, where it can act on membrane receptors and stromal proteins.

Zymogen Processing & Activation

CTSG is synthesised as a 255-amino-acid preproprotein. Cleavage of the ~18-residue signal peptide yields the proenzyme; removal of a short N-terminal propeptide (approximately residues 19–28 of the full-length sequence) then generates the active, two-chain enzyme held together by a single disulfide bond. This processing is accomplished by dipeptidyl peptidase I (cathepsin C/DPPI) in the azurophilic granule, a shared activation mechanism with neutrophil elastase and proteinase 3. The active enzyme is cationic (pI ~12) and associates non-covalently with the negatively charged surface of the plasma membrane and extracellular matrix, concentrating its activity at sites of neutrophil adhesion.

Key Substrates & Signalling Roles

Cathepsin G cleaves a broad spectrum of substrates relevant to haemostasis, inflammation, and tissue remodelling. It activates platelet aggregation through proteolytic cleavage of protease-activated receptor 4 (F2RL3/PAR4) and can either activate or inactivate PAR1 (F2R) depending on cleavage site. Additional substrates include complement component C3, thrombomodulin, vimentin, cortactin, the synovial lubricant PRG4/lubricin, and interleukin-36γ. The enzyme also degrades extracellular matrix components including fibronectin and laminin, contributing to tissue injury during sustained inflammation. Notably, antibacterial activity against both Gram-positive and Gram-negative organisms has been documented independently of catalytic function.

Inhibitor Profile

The primary physiological inhibitor of extracellular Cathepsin G is α1-antichymotrypsin (SERPINA3), a serpin that forms a stable covalent complex with the active-site serine. Alpha-1-proteinase inhibitor (SERPINA1/α1-antitrypsin) also inhibits Cathepsin G, albeit with lower association rate constants than for neutrophil elastase. Secretory leukocyte protease inhibitor (SLPI) provides additional mucosal control. Elafin/SKALP (PI3) and the chelonianin-family inhibitors can inhibit Cathepsin G at sites of inflammation. In the context of certain cancers and inflammatory diseases, depletion of these inhibitors may shift the

local balance toward sustained proteolytic activity.

Disease Relevance

Cathepsin G is implicated in the pathogenesis of several inflammatory and malignant conditions. Elevated extracellular Cathepsin G contributes to cartilage and connective tissue destruction in rheumatoid arthritis and periodontitis through degradation of structural matrix proteins. In atherosclerosis, CTSG released from plaque-associated neutrophils and mast cells processes matrix and apolipoprotein substrates. The enzyme has been reported to promote tumour cell invasion and immune evasion in certain haematological malignancies, and its expression is altered in acute myeloid leukaemia. Conversely, CTSG's bactericidal activity places it as a contributor to innate host defence, and loss-of-function states may compromise neutrophil-mediated killing.

Gene & Protein Reference

Gene Symbol	CTSG
HGNC	HGNC:2532
NCBI Gene ID (Human)	1511
NCBI Gene ID (Mouse)	13035
Ensembl	ENSG00000113088
OMIM	116830
UniProt (Human)	P08311
UniProt (Mouse)	P28293
Protein Family	S1 (chymotrypsin-fold) serine protease; peptidase S1A subfamily; neutrophil serine protease subgroup
Predicted MW	~28.8 kDa (mature enzyme, single chain equivalent); ~26.8 kDa after signal peptide and propeptide removal
Observed MW	~25–30 kDa by SDS-PAGE (glycosylation-dependent; predominantly ~28 kDa under reducing conditions)
Chromosome	14q11.2
Paralogue	Neutrophil elastase (ELANE), Proteinase 3 (PRTN3), Azurocidin (AZU1)
Key Substrates	PAR4 (F2RL3), PAR1 (F2R), complement C3, thrombomodulin, vimentin, cortactin, PRG4/lubricin, IL-36γ, fibronectin, laminin
Activated by	Dipeptidyl peptidase I (Cathepsin C/DPPI) — removes N-terminal propeptide in azurophilic granule
Inhibited by	α1-antichymotrypsin (SERPINA3), α1-antitrypsin (SERPINA1), SLPI, Elafin/PI3

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.