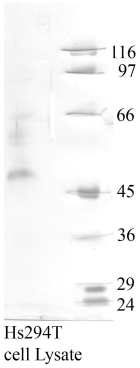
Anti-CTSW Rabbit Polyclonal Antibody

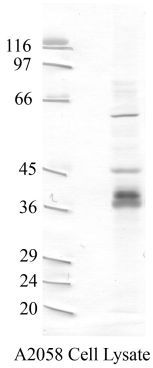
Cathepsin W, EC 3.4.22.-, Lymphopain,

Gene: CTSW **UniProt:** P56202 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



Propeptide domain
RP1CathepsinW



Catalytic domain
RP2CathepsinW

— Western Blot (2-panel validation across domain-specific antibody clones)

Actual Western blot validation for anti-CTSW rabbit polyclonal antibody. 2-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-CTSW Rabbit Polyclonal Antibody
Gene Symbol	CTSW
Alternative Names	Cathepsin W, EC 3.4.22.-, Lymphopain,
UniProt ID	P56202
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, Cat
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-w-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CTSW. 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	**22–127** Region spanning the N-terminal propeptide of human Cathepsin W, which functions as an intramolecular inhibitory domain occluding the active-site cleft in the zymogen; this segment is proteolytically removed upon activation and is absent from the mature enzyme	RP1Cathepsin W	In catalog
Catalytic domain	**128–376** Region encompassing the mature catalytic domain of human Cathepsin W, containing the conserved papain-family Cys-His-Asn catalytic triad and the substrate-binding cleft; this domain constitutes the entirety of the processed, enzymatically active form of the protein	RP2Cathepsin W	In catalog
—	**128–376** Region spanning the full-length human Cathepsin W precursor, encompassing both the N-terminal inhibitory propeptide and the mature catalytic domain; immunogen coverage across both domains makes this variant suitable for detection of zymogen and processed forms	RP-Cathepsin W	In catalog

Applications & Recommended Dilutions

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

Cathepsin W (CTSW; also known as lymphopain) is a cysteine protease belonging to the papain superfamily (clan CA, family C1). Unlike the majority of cathepsins, which are broadly expressed lysosomal hydrolases with housekeeping degradative roles, CTSW displays a strikingly restricted tissue distribution and a poorly defined substrate repertoire. The mature human protein is 376 amino acids in length and is encoded by a single gene on chromosome 11q13.1. CTSW carries the hallmark Cys-His-Asn catalytic triad conserved across papain-like proteases and is classified under EC 3.4.22.-.

Expression & Localisation

CTSW expression is highly tissue-restricted, with predominant mRNA and protein detected in CD8+ cytotoxic T lymphocytes (CTLs) and natural killer (NK) cells. Expression is low to absent in most other tissues, a pattern unusual within the cathepsin family. At the subcellular level, CTSW localises primarily to the endoplasmic reticulum rather than to lysosomes, distinguishing it further from classical lysosomal cathepsins. Single-cell transcriptomic studies confirm that CTSW transcript levels track closely with cytotoxic effector signatures in both circulating and tissue-resident lymphocyte populations.

Zymogen Structure & Activation Mechanism

CTSW is synthesised as an inactive zymogen comprising an N-terminal propeptide (approximately residues 1–114 of the full-length precursor) followed by the catalytic domain. The propeptide functions as an intramolecular inhibitor that occludes the active-site cleft, a regulatory mechanism conserved across papain-family cysteine proteases. Proteolytic removal of the propeptide—either autocatalytically under acidic conditions or via trans-processing by another protease—yields the mature, active enzyme. The precise in vivo processing machinery for CTSW and the compartment in which activation occurs remain subjects of ongoing investigation.

Substrates & Inhibitor Profile

Defined physiological substrates for CTSW remain largely uncharacterised relative to other cathepsins. In vitro, the enzyme displays endopeptidase activity and can cleave synthetic fluorogenic substrates with preference for hydrophobic residues at the P2 position, consistent with the active-site topology of papain-like proteases. CTSW activity is inhibited by classical cysteine protease inhibitors including E-64, leupeptin, and the endogenous cystatin superfamily members. Cystatins B and C both suppress CTSW activity in biochemical assays. No selective small-molecule inhibitor or endogenous regulatory protein specific to CTSW has been characterised to date.

Role in Cytotoxic Lymphocyte Biology

The restricted co-expression of CTSW with perforin and granzymes in CTLs and NK cells implies a functional role in lymphocyte-mediated cytotoxicity or in the biogenesis of cytotoxic granules. UniProt annotations indicate a putative function in the mechanism or regulation of T-cell cytolytic activity, though direct mechanistic evidence is limited. Its ER localisation raises the possibility that CTSW participates in antigen processing, protein quality control, or granule biogenesis upstream of exocytosis, rather than acting as a terminal effector protease at the target-cell interface.

Disease Relevance

Altered CTSW expression has been documented in hematologic malignancies characterised by expanded cytotoxic lymphocyte populations, including certain cutaneous T-cell lymphomas and NK/T-cell lymphomas, where it may serve as a lineage marker or contribute to tumour-cell behaviour. In solid tumour immunology, CTSW expression within the tumour-infiltrating lymphocyte compartment has been associated with cytotoxic immune infiltrates and used as a transcriptomic proxy for CTL and NK content. CTSW has also been identified as a candidate biomarker in studies profiling immune effector function in infectious disease and transplant immunology contexts.

Gene & Protein Reference

Gene Symbol	CTSW
HGNC	HGNC:2534
NCBI Gene ID (Human)	1521
NCBI Gene ID (Mouse)	13038
Ensembl	ENSG00000172543
OMIM	602310
UniProt (Human)	P56202
UniProt (Mouse)	O35461
Protein Family	Papain superfamily, clan CA, family C1 cysteine proteases
Predicted MW	~42 kDa (full-length precursor); ~28 kDa (mature processed form)
Observed MW	~37–42 kDa (reported by Western blot, varies with processing state)
Chromosome	11q13.1
Paralogue	CTSL (Cathepsin L); CTSV (Cathepsin V) — closest paralogues within the C1 family
Key Substrates	Precise physiological substrates not fully characterised; cleaves synthetic substrates with hydrophobic P2 preference in vitro
Activated by	Autocatalytic processing under acidic conditions; possible trans-processing by other cysteine proteases
Inhibited by	E-64, leupeptin, cystatin B, cystatin C

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.