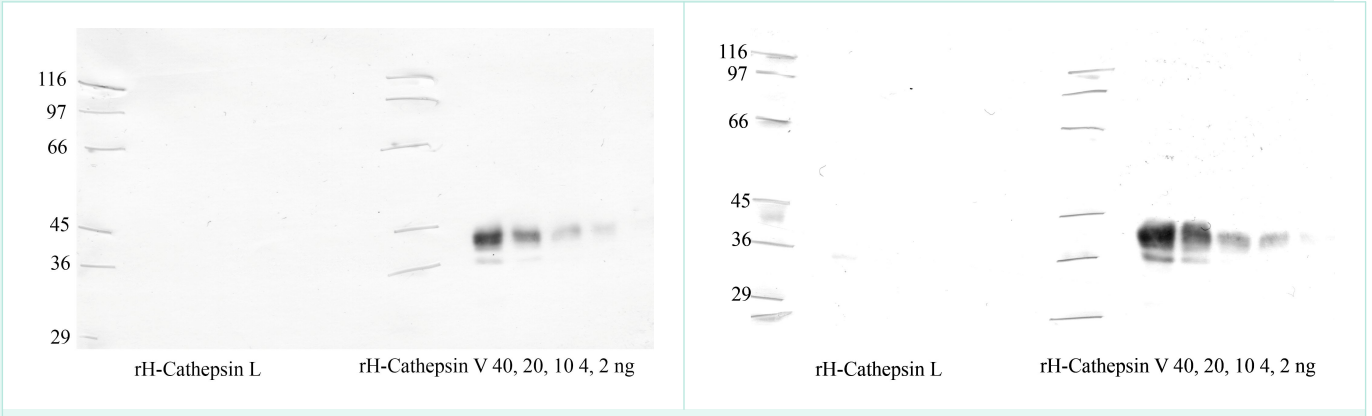
Anti-CTSV Rabbit Polyclonal Antibody

Cathepsin L2, EC 3.4.22.43, Cathepsin U, Cathepsin V,

Gene: CTSV **UniProt:** O60911 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



Propeptide domain
RP1CathepsinV

Catalytic domain
RP2CathepsinV

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

Actual Western blot validation for anti-CTSV 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-CTSV Rabbit Polyclonal Antibody
Gene Symbol	CTSV
Alternative Names	Cathepsin L2, EC 3.4.22.43, Cathepsin U, Cathepsin V,
UniProt ID	O60911
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-cathepsin-v-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CTSV. 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	**18–113** Region spanning the propeptide (inhibitory pro-domain) of human Cathepsin V, located between the signal peptide cleavage site and the N-terminus of the mature catalytic chain; this domain occludes the active-site cleft in the zymogen and is removed during lysosomal activation	RP1Cathepsin V	In catalog
Catalytic domain	**114–334** Region encompassing the mature catalytic domain of human Cathepsin V, which adopts a bilobal papain-like fold housing the Cys-His-Asn catalytic triad responsible for cysteine endopeptidase activity; this domain is generated following propeptide removal in the acidic lysosomal compartment	RP2Cathepsin V	In catalog
—	**114–334** Region covering the full-length proenzyme of human Cathepsin V (excluding signal peptide), encompassing both the inhibitory propeptide and the mature catalytic domain; antibodies raised against this broad region recognise multiple epitopes across the zymogen and active enzyme forms	RP-CathepsinV	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

Cathepsin V (CTSV; also Cathepsin L2 or Cathepsin U; EC 3.4.22.43) is a lysosomal cysteine endopeptidase of the papain-like peptidase C1 family (clan CA). The 334-residue mature protein shares approximately 78% amino acid sequence identity with the ubiquitous Cathepsin L yet occupies a distinct phylogenetic branch defined by its restricted tissue expression and unique substrate preferences. Like other C1-family cathepsins, CTSV adopts a bilobal fold in which the catalytic triad (Cys-His-Asn) spans the cleft between the L- and R-domains, conferring potent endopeptidase activity with additional exopeptidase capability under acidic lysosomal conditions.

Expression & Localisation

CTSV expression is markedly tissue-restricted compared with Cathepsin L. Highest transcript and protein levels are consistently detected in thymus, testis, corneal epithelium, and skin epidermis. Within cells, newly synthesised CTSV is routed through the endosomal–lysosomal pathway via mannose-6-phosphate receptor-dependent trafficking, accumulating in late endosomes and lysosomes. Limited secretion of precursor forms into the extracellular space has been reported in some tumour models. This compartmentalisation means that CTSV activity is pH-dependent and predominantly intracellular under physiological conditions, distinguishing it from secreted matrix metalloproteinases.

Activation Mechanism

CTSV is synthesised as an ~37 kDa preproenzyme. Cleavage of the N-terminal signal peptide yields the ~34 kDa proenzyme, in which the propeptide domain occludes the active-site cleft and maintains latency by coordinating the catalytic cysteine. Autocatalytic processing at acidic pH, assisted by other cysteine cathepsins, removes the propeptide to generate the mature two-chain or single-chain active forms. This pH-dependent activation confines proteolytic activity to the acidic lysosomal lumen and prevents inadvertent degradation of cytosolic proteins. The propeptide itself functions as an intramolecular chaperone required for correct folding and lysosomal targeting of the zymogen.

Key Substrates & Functions

In thymic epithelial cells, CTSV participates in MHC class II-restricted antigen presentation by generating antigenic peptides and processing the invariant chain (CD74), a role it shares with Cathepsin L in mice but performs more prominently in the human thymus. In corneal epithelium, CTSV contributes to extracellular matrix remodelling and keratinocyte homeostasis. The enzyme efficiently cleaves collagens, laminin, fibronectin, and several intracellular structural proteins under acidic conditions. Its elastinolytic activity — among the strongest recorded for human cathepsins — suggests additional roles in tissue remodelling where elastin turnover is relevant.

Inhibitor Profile

Like other C1-family cathepsins, CTSV is potently inhibited by the endogenous cystatin superfamily, particularly Cystatin C, Cystatin B, and the kininogens. Stefin B (Cystatin B) acts as a tight-binding competitive inhibitor in the nanomolar range. Synthetic active-site-directed inhibitors including E-64, leupeptin, and vinyl-sulfone-based compounds irreversibly block CTSV activity by reacting with the catalytic cysteine. CA-074 and related epoxysuccinyl derivatives show selectivity for Cathepsin B over CTSV, providing a useful pharmacological discrimination tool in cell-based studies.

Disease Relevance

Elevated CTSV expression has been documented in several carcinomas — including breast, gastric, colorectal, and thyroid cancers — where it correlates with invasive phenotype, likely reflecting roles in basement membrane degradation and pro-tumourigenic matrix remodelling. In the skin, altered CTSV activity is associated with inflammatory dermatoses and impaired epidermal barrier function. Emerging evidence links CTSV to autoimmune thyroid disease through its expression in thyrocytes and potential role in antigen presentation. Because of its elastinolytic potency, CTSV is also implicated in atherosclerotic plaque instability. Its restricted normal-tissue expression profile makes it an attractive candidate biomarker and therapeutic target in oncology.

Gene & Protein Reference

Gene Symbol	CTSV
HGNC	HGNC:2535
NCBI Gene ID (Human)	1515
NCBI Gene ID (Mouse)	N/A (no direct orthologue; Ctsl serves analogous thymic role in mouse)
Ensembl	ENSG00000135047
OMIM	603611
UniProt (Human)	O60911
UniProt (Mouse)	N/A
Protein Family	Peptidase C1 (papain) family, Cathepsin L subfamily
Predicted MW	~37 kDa (preproenzyme); ~25 kDa (mature single-chain form)
Observed MW	~28–34 kDa by SDS-PAGE depending on processing state and glycosylation
Chromosome	9q22.2
Paralogue	CTSL (Cathepsin L; ~78% aa identity)
Key Substrates	Invariant chain (CD74), collagen types I/IV, laminin, fibronectin, elastin, extracellular matrix components
Activated by	Autocatalytic processing at acidic pH; assisted by cysteine cathepsins in the lysosomal lumen
Inhibited by	Cystatin C, Cystatin B (Stefin B), kininogens; synthetic inhibitors E-64, leupeptin, vinyl-sulfone cysteine protease inhibitors

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.