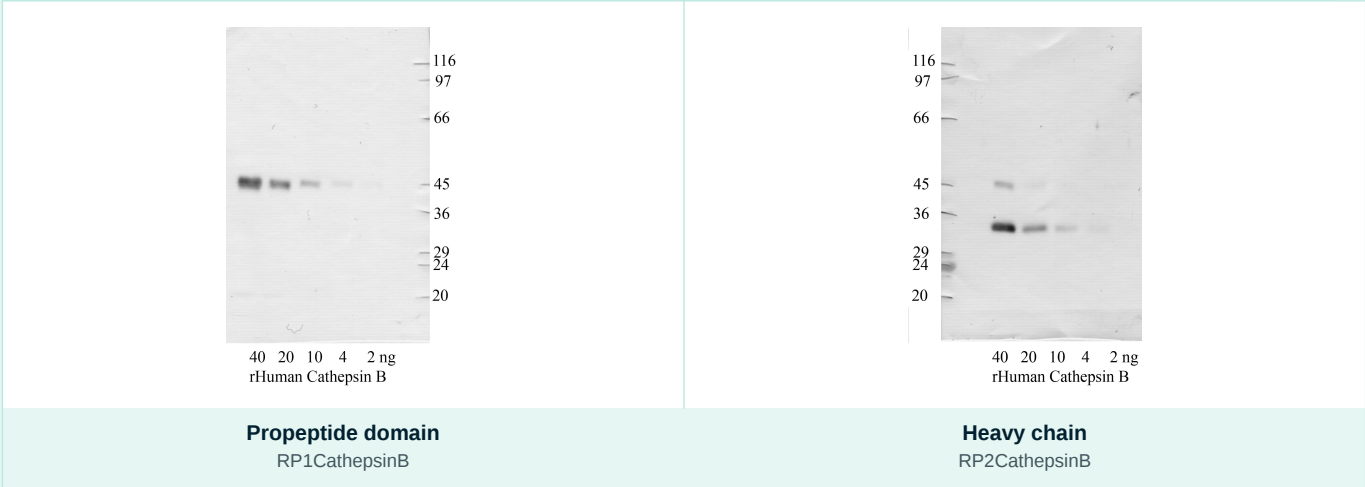


Anti-CTSB Rabbit Polyclonal Antibody

Cathepsin B, EC 3.4.22.1, APP secretase, APPS, Cathepsin B1,
Gene: CTSB **UniProt:** P07858 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



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

Actual Western blot validation for anti-CTSB 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-CTSB Rabbit Polyclonal Antibody
Gene Symbol	CTSB
Alternative Names	Cathepsin B, EC 3.4.22.1, APP secretase, APPS, Cathepsin B1,
UniProt ID	P07858
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, Pig
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-b-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CTSB. 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
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Propeptide domain	18–79 Region within the N-terminal propeptide of human cathepsin B, which functions as an intramolecular inhibitor and chaperone during biosynthetic transit through the secretory pathway; this segment is removed during lysosomal activation and is absent from the mature enzyme	RP1Cathepsin B	In catalog
Heavy chain	129–333 Region spanning the heavy chain of the mature two-chain form of human cathepsin B, encompassing the core papain-like catalytic domain including the active-site Cys and His residues and the characteristic occluding loop that confers exopeptidase activity	RP2Cathepsin B	In catalog
—	80–333 Broad region covering multiple domains of human cathepsin B including the propeptide and the mature heavy- and light-chain regions, providing reactivity across both proenzyme and processed forms of the protein	RP-CathepsinB	In catalog

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
WB	Validated- Human Potenti- al-Mouse, Rat, Pan, Monkey, Dog, Pig	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 B (CTSB, EC 3.4.22.1) is a lysosomal cysteine protease of the papain superfamily (clan CA, family C1). It is one of eleven human cathepsins in this family and is among the most broadly expressed. The enzyme operates optimally at the acidic pH of the lysosomal lumen (pH 4.5–5.5) and carries the catalytic triad characteristic of cysteine proteases: Cys, His, and Asn. Uniquely among cathepsins, CTSB possesses an occluding loop insertion that confers carboxydipeptidase (exopeptidase) activity in addition to its endopeptidase function, making it catalytically versatile relative to other family members.

Biosynthesis & Activation

CTSB is synthesized as a ~43 kDa prepropeptide comprising a signal peptide (~17 aa), a propeptide (~62 aa), and the mature protease chain. Following co-translational translocation into the ER and mannose-6-phosphate-directed trafficking to the endolysosomal system, the signal peptide is cleaved and the propeptide is removed autocatalytically or by other cathepsins under acidic conditions. The mature form is a disulfide-linked two-chain enzyme (~25 kDa heavy chain + ~5 kDa light chain) observable under non-reducing SDS-PAGE as a single-chain species (~28 kDa) due to the intact disulfide bond. The propeptide acts as an intramolecular chaperone and inhibitor during transit.

Expression & Localisation

CTSB is ubiquitously expressed, with highest levels in liver, kidney, spleen, and placenta, and notable expression in macrophages, osteoclasts, and epithelial cells. Transcript and protein are detectable across essentially all mammalian tissues examined. Subcellularly, CTSB resides primarily in lysosomes and late endosomes. Under pathological conditions—including inflammation, hypoxia, and neoplastic transformation—CTSB can be secreted into the extracellular space or redistributed to the plasma membrane, pericellular vesicles, or the cytoplasm, expanding its substrate repertoire and biological impact beyond the lysosomal compartment.

Key Substrates & Inhibitor Profile

Within the lysosome, CTSB degrades a broad spectrum of intracellular and endocytosed proteins as part of normal protein homeostasis. Documented substrates include matrix extracellular phosphoglycoprotein (MEPE), thyroglobulin (supporting thyroid hormone liberation), type IV collagen, laminin, fibronectin, and components of the extracellular matrix relevant to tissue remodeling. CTSB also cleaves amyloid precursor protein (APP) and has been characterised as an APP secretase. Endogenous inhibitors include the cystatins (cystatin B/stefin B and cystatin C) and α 2-macroglobulin. The broad-spectrum cysteine protease inhibitor E-64 and its cell-permeable derivative CA-074 are widely used experimental tools to block CTSB activity selectively.

Disease Relevance

Elevated CTSB expression and extracellular secretion have been documented in numerous carcinomas—including breast, colorectal, lung, and glioblastoma—where the enzyme promotes basement membrane degradation, tumour invasion, and metastasis. CTSB has been studied in the context of Alzheimer's disease both as an APP-processing secretase and as a mediator of lysosomal membrane permeabilisation that can trigger apoptotic cascades. In inflammatory conditions such as rheumatoid arthritis, CTSB released by synovial macrophages contributes to cartilage erosion. Dysregulated CTSB has also been implicated in pancreatitis, where premature intracellular activation of trypsinogen is partly attributed to cathepsin-mediated cleavage in acinar cells.

Autophagy & Antigen Processing

CTSB participates in macroautophagy by degrading cargo delivered to autolysosomes, contributing to organelle quality control and nutrient recycling under starvation conditions. In the immune system, CTSB assists in MHC class II-restricted antigen presentation by processing endocytosed antigens within endolysosomal compartments. The enzyme can also activate other lysosomal hydrolases by limited proteolysis, positioning it as a regulatory node in lysosomal biology. Its capacity to process pro-forms of other cathepsins (e.g., pro-cathepsin D) underscores its upstream role in maintaining overall lysosomal protease

activity.

Gene & Protein Reference

Gene Symbol	CTSB
HGNC	2527
NCBI Gene ID (Human)	1508
NCBI Gene ID (Mouse)	13030
Ensembl	ENSG00000164733
OMIM	116810
UniProt (Human)	P07858
UniProt (Mouse)	P10605
Protein Family	Papain superfamily; peptidase C1 family (clan CA)
Predicted MW	~37.8 kDa (precursor); ~28 kDa (mature single-chain); ~25 kDa heavy chain + ~5 kDa light chain (two-chain form)
Observed MW	~28–30 kDa (reducing SDS-PAGE, mature); ~43 kDa (non-reducing, prepro form); double band pattern may be observed reflecting single- and two-chain forms
Chromosome	8p23.1
Paralogue	Cathepsin L (CTSL), Cathepsin H (CTSH), Cathepsin S (CTSS)
Key Substrates	Thyroglobulin, matrix extracellular phosphoglycoprotein (MEPE), amyloid precursor protein (APP), type IV collagen, laminin, fibronectin, pro-cathepsin D
Activated by	Autocatalytic processing under acidic pH (lysosomal); processing by other cathepsins (e.g., cathepsin D, cathepsin L)
Inhibited by	Cystatin B (stefin B), cystatin C, α2-macroglobulin, E-64, CA-074 (selective cell-permeable inhibitor)

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.