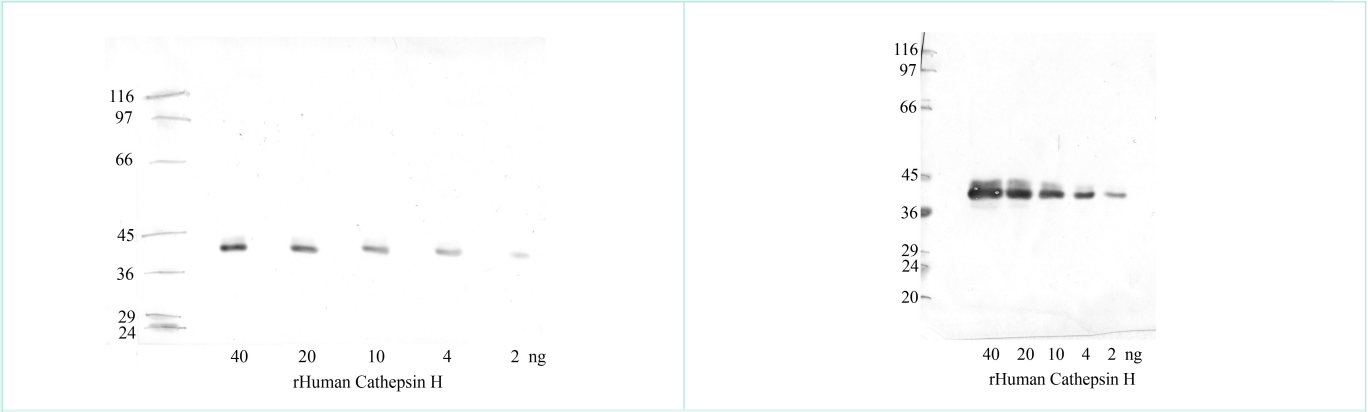
Anti-CTSH Rabbit Polyclonal Antibody

Pro-cathepsin H,

Gene: CTSH **UniProt:** P09668 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



Propeptide domain
RP1CathepsinH

Catalytic domain
RP2CathepsinH

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

Actual Western blot validation for anti-CTSH 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-CTSH Rabbit Polyclonal Antibody
Gene Symbol	CTSH
Alternative Names	Pro-cathepsin H,
UniProt ID	P09668
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-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-h-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CTSH. 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	**23–97** Region within the N-terminal propeptide of human cathepsin H, spanning the autoinhibitory segment that occupies the active-site cleft during zymogen trafficking; this domain is cleaved during lysosomal activation to yield the mature enzyme and is absent from the processed heavy chain	RP1Cathepsin H	In catalog
Catalytic domain	**116–335** Region within the heavy chain of the mature cathepsin H catalytic domain, encompassing the core papain-fold with the Cys-His-Asn catalytic triad; present in both the proenzyme and the fully processed mature two-chain form of the enzyme	RP2Cathepsin H	In catalog
—	**116–335** Broad region spanning multiple domains of human cathepsin H, including the propeptide, heavy-chain catalytic domain, and mini-chain segments; suitable for general detection of both the latent pro-form and the mature processed enzyme across a range of experimental contexts	RP-CathepsinH	In catalog

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
WB	Validated-Human Potential-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 H (CTSH, UniProt P09668) is a lysosomal cysteine protease of the papain superfamily (clan CA, family C1). It is synthesized as a 335-amino acid prepro-enzyme and is unusual among cathepsins in possessing both endopeptidase and exopeptidase (aminopeptidase) activities. The aminopeptidase function arises from a short N-terminal mini-chain that remains disulfide-linked to the heavy chain after activation, physically occluding the non-primed substrate-binding subsites and restricting access to the P1 residue of substrates. This structural feature makes cathepsin H biochemically distinct from the predominantly endoproteolytic cathepsins B, L, and S.

Expression & Localisation

CTSH is expressed broadly across human tissues, with notably high levels in liver, kidney, lung, placenta, and brain. Expression is also detected in professional antigen-presenting cells, including dendritic cells and macrophages, consistent with roles in the endolysosomal antigen-processing pathway. At the subcellular level, cathepsin H localises primarily to lysosomes and late endosomes, with a proportion of the proenzyme detectable in the endoplasmic reticulum and Golgi during trafficking. Secreted forms have been reported in pathological contexts such as tumour microenvironments, where extracellular cathepsin H activity may contribute to extracellular matrix remodelling.

Activation Mechanism

Pro-cathepsin H is activated by the removal of its N-terminal propeptide, which serves an autoinhibitory function by occupying the active-site cleft and maintaining the enzyme in a latent state during biosynthesis and lysosomal trafficking. Activation proceeds through autocatalytic processing at acidic pH within the lysosomal lumen, as well as by trans-processing via other lysosomal cysteine proteases. Upon propeptide removal, the mature enzyme adopts its two-chain form—a heavy chain (~25 kDa) and a mini-chain (~6 kDa)—held together by a disulfide bond, with the mini-chain conferring aminopeptidase specificity to the active enzyme.

Key Substrates & Inhibitor Profile

Cathepsin H hydrolyses a range of protein and peptide substrates via its dual activities. As an aminopeptidase, it removes single amino acid residues from unblocked N-termini, contributing to terminal trimming of antigenic peptides within the MHC class II loading compartment. Documented protein substrates include components of the extracellular matrix and intermediate filament proteins. Cathepsin H is potently inhibited by the endogenous cystatin superfamily members, including cystatin C, stefin A (cystatin A), and stefin B (cystatin B). Synthetic inhibitors such as E-64 and its derivatives also effectively block activity, and the enzyme is sensitive to broad-spectrum cysteine protease inhibitors used in research applications.

Disease Relevance

Dysregulation of cathepsin H has been associated with multiple disease states. In oncology, elevated CTSH expression or activity has been reported in lung, prostate, colorectal, and thyroid carcinomas, where it is thought to facilitate tumour invasion through degradation of extracellular matrix components and activation of pro-tumourigenic signalling mediators. In neurodegeneration, cathepsin H is implicated in lysosomal dysfunction associated with neuronal ceroid lipofuscinosis and Parkinson's disease pathology, partly through dysregulated protein turnover. Altered CTSH expression has also been noted in type 2 diabetes and related metabolic disorders, implicating the enzyme in beta-cell biology and insulin processing.

Research Applications

Antibodies targeting specific domains of cathepsin H allow researchers to distinguish proenzyme from mature forms, map processing intermediates, and localise the protein within tissue sections and cell compartments. Propeptide-directed antibodies are particularly valuable for detecting the latent zymogen in biosynthesis and trafficking studies, while catalytic domain antibodies detect both proenzyme and mature forms. Immunohistochemical detection of cathepsin H in tumour biopsies and immunofluorescence co-localisation with lysosomal markers such as LAMP1 are established uses. Western blot analysis typically resolves the proenzyme (~41 kDa) and mature heavy chain (~25–28 kDa) as distinct bands, providing a convenient

index of processing status.

Gene & Protein Reference

Gene Symbol	CTSH
HGNC	2535
NCBI Gene ID (Human)	1512
NCBI Gene ID (Mouse)	13036
Ensembl	ENSG00000137309
OMIM	116820
UniProt (Human)	P09668
UniProt (Mouse)	P49935
Protein Family	Papain superfamily; peptidase family C1 (clan CA); lysosomal cysteine protease
Predicted MW	~37 kDa (prepro-form); ~28 kDa (heavy chain, mature)
Observed MW	~41 kDa (pro-cathepsin H by SDS-PAGE); ~25–28 kDa (mature heavy chain); ~6 kDa (mini-chain)
Chromosome	15q25.1
Paralogue	Cathepsin B (CTSB), Cathepsin L (CTSL), Cathepsin S (CTSS)
Key Substrates	MHC class II-associated antigenic peptides (N-terminal trimming); extracellular matrix glycoproteins; intermediate filament proteins
Activated by	Autocatalytic processing at lysosomal pH; trans-activation by other lysosomal cysteine proteases (e.g., cathepsin L, cathepsin D)
Inhibited by	Cystatin C, stefin A (cystatin A), stefin B (cystatin B), E-64, leupeptin, broad-spectrum 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.