Anti-CSTB Rabbit Polyclonal Antibody

Cystatin-B, CPI-B, Liver thiol proteinase inhibitor, Stefin-B,

Gene: CSTB **UniProt:** P04080 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image

Image placeholder — Western Blot

— Western Blot

Suggested image: Western blot of relevant cell or tissue lysates under reducing conditions, probed with the domain-specific antibody. Include a positive-control lane and empty-vector or knockout negative control. Loading: 10–20 µg/lane on 7.5–10% SDS-PAGE.

Key Product Facts

Supplier	Triple Point Biologics, Inc. (Sudbury, Ontario, Canada)
Product Name	Anti-CSTB Rabbit Polyclonal Antibody
Gene Symbol	CSTB
Alternative Names	Cystatin-B, CPI-B, Liver thiol proteinase inhibitor, Stefin-B,
UniProt ID	P04080
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-cystatin-b-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CSTB. 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

Aminoterminus and alpha helical domain.	**1–51** Region spanning the unstructured N-terminal segment and the single alpha-helix of mature CSTB, which together form one arm of the tripartite cathepsin-binding interface and constitute the major structural scaffold of this small stefin	RP1CystatinB	In catalog
Cartboxyterminus	**48–98** Region within the C-terminal segment of CSTB, distal to the second beta-hairpin loop, encompassing the short tail that completes the beta-strand framework and lies away from the primary cathepsin active-site contact surface	RP2CystatinB	In catalog
—	**1–98** Full-length CSTB encompassing the N-terminal segment, alpha-helix, both beta-hairpin loops (L1 and L2), and C-terminal tail — covering all structural elements of this 98-amino acid stefin and the complete cathepsin-binding wedge	RP-CystatinB	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

Protein Family and General Biology

Cystatin-B (CSTB; also Stefin-B, CPI-B) is a 98-amino acid intracellular member of the cystatin superfamily, classified within Family 1 (stefins). Unlike Family 2 cystatins, which carry a signal peptide and are secreted, CSTB lacks a signal sequence and disulfide bonds, and functions exclusively within the intracellular compartment. It acts as a tight-binding, reversible inhibitor of papain-family cysteine proteases, forming 1:1 stoichiometric complexes through a wedge-shaped tripartite binding mechanism that occludes the active-site cleft of target cathepsins.

Expression and Subcellular Localisation

CSTB is ubiquitously expressed across human tissues, with particularly high transcript and protein levels in liver, brain, and hematopoietic cells. At the subcellular level, CSTB localises predominantly to the cytoplasm and nucleus, but can also be found associated with lysosomal membranes under stress conditions. This perilysossomal pool is thought to provide a first-line defence against cathepsins released during lysosomal membrane permeabilisation. In neurons, CSTB is expressed throughout development and in mature cells, consistent with its proposed role in regulating protease activity during synaptic remodelling and cellular homeostasis.

Inhibitory Mechanism and Target Cathepsins

CSTB inhibits cathepsins B, H, and L with dissociation constants in the picomolar-to-low nanomolar range, making it one of the most potent endogenous regulators of these lysosomal cysteine proteases. Inhibition is achieved through a conserved wedge mechanism: the N-terminal region and two hairpin loops of CSTB engage the active-site cleft of the cathepsin in a non-covalent, reversible manner. The protein does not inhibit serine or aspartic proteases. CSTB also inhibits cathepsin S and, to a lesser extent, cathepsin K, extending its regulatory reach across multiple physiologically important cysteine proteases.

Role in Apoptosis, Autophagy, and Cellular Stress

Beyond direct protease inhibition, CSTB participates in the regulation of apoptosis and autophagy. During lysosomal membrane permeabilisation — a feature of both intrinsic apoptosis and oxidative stress — cathepsin release into the cytosol can trigger caspase-independent cell death. CSTB limits this by sequestering escaped cathepsins before they reach nuclear or cytoskeletal substrates. In autophagy, CSTB modulates cathepsin-dependent cargo degradation within the autolysosome. Loss of CSTB leads to elevated cathepsin activity, oxidative stress accumulation, and increased susceptibility to apoptotic stimuli, particularly in neuronal populations.

Disease Relevance: Unverricht-Lundborg Disease and Neurodegeneration

Loss-of-function mutations in CSTB — most commonly an unstable dodecamer repeat expansion in the promoter region — cause Unverricht-Lundborg disease (EPM1; OMIM 254800), an autosomal recessive progressive myoclonus epilepsy. Reduced CSTB expression results in uncontrolled cathepsin activity, neuronal apoptosis, cerebellar atrophy, and the clinical hallmarks of stimulus-sensitive myoclonus and tonic-clonic seizures. CSTB-knockout mouse models closely recapitulate the human phenotype, exhibiting ataxia, myoclonus, and progressive Purkinje cell loss. Beyond EPM1, dysregulation of the CSTB/cathepsin axis has been implicated in cancer invasion, inflammatory disease, and lysosomal storage disorders.

Research Applications

CSTB is used as a biochemical readout for cathepsin inhibitory tone, protease-inhibitor balance during cellular stress, and as a marker in epilepsy pathogenesis research. Western blot detection of CSTB typically resolves a band near 11 kDa; apparent molecular weight can shift slightly depending on buffer conditions and gel percentage. IHC and immunofluorescence are used to map CSTB expression in brain sections from EPM1 models and in tumour microenvironments where cathepsin activity is elevated. CSTB antibodies are also employed in co-immunoprecipitation and proximity ligation assays to study cathepsin-CSTB complex formation under stress conditions.

Gene & Protein Reference

Gene Symbol	CSTB

HGNC	HGNC:2475
NCBI Gene ID (Human)	1476
NCBI Gene ID (Mouse)	13010
Ensembl	ENSG00000160213
OMIM	601145
UniProt (Human)	P04080
UniProt (Mouse)	P07463
Protein Family	Cystatin superfamily, Family 1 (stefins); intracellular, non-secreted cysteine protease inhibitor
Predicted MW	~11.0 kDa (98 amino acids, unprocessed; no signal peptide cleavage)
Observed MW	~11 kDa by SDS-PAGE (may appear as a diffuse band near 11 kDa)
Chromosome	21q22.3
Paralogue	Cystatin-A (CSTA; Stefin-A)
Key Substrates	Not applicable (CSTB is an inhibitor, not a protease); target proteases inhibited: Cathepsin B, Cathepsin H, Cathepsin L, Cathepsin S, Cathepsin K
Activated by	Not applicable (constitutively active inhibitor; no zymogen processing required)
Inhibited by	Not applicable at the protein level; CSTB expression is reduced by dodecamer repeat expansion in the CSTB promoter (EPM1 mutation) and by promoter methylation

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