

Anti-CAST Rabbit Polyclonal Antibody

Calpastatin, Calpain inhibitor, Sperm BS-17 component,

Gene: CAST **UniProt:** P20810 **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-CAST Rabbit Polyclonal Antibody
Gene Symbol	CAST
Alternative Names	Calpastatin, Calpain inhibitor, Sperm BS-17 component,
UniProt ID	P20810
Host Species	Rabbit
Clonality	Polyclonal (pAb)
Isotype	IgG
Concentration	1mg/ml
Purity	Affinity purified
Pack Size	100ug
Validated Application	WB, IF
Recommended Dilution	WB-1/1000
Species Reactivity	Validated- Human Potential-Mouse, Dog
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-calpastatin-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CAST. 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
------------------	-----------------------------------	----------	--------------

Testis Isoform (Isoforms X24 and X25)	~1–17 (testis isoform numbering; corresponds to the unique N-terminal region of the testis-specific short isoform, absent from somatic long isoforms) Region within the unique N-terminal segment of the testis-specific short isoform of calpastatin (Sperm BS-17 component), encoded downstream of an internal promoter; this sequence is not present in somatic long isoforms and provides isoform-selective recognition of the spermatogenic variants X24 and X25	RP1Calpastatin	In catalog
Carboxyterminal end long isoform (all isoforms except X23)	658–708 Region spanning the extreme C-terminal end of the canonical long isoform of human calpastatin, downstream of inhibitory domain 4; this segment is shared across all major somatic isoforms except the truncated X23 variant and provides broad cross-reactivity against long-form CAST expression products	RP2Calpastatin	In catalog
Linker between Domains 2C and 3A (all isoforms)	~360–400 (approximate inter-domain linker region between the C-subregion of inhibitory domain 2 and the A-subregion of inhibitory domain 3) Region within the flexible interdomain linker connecting subregion C of inhibitory domain 2 and subregion A of inhibitory domain 3 of human calpastatin; this linker is present in all canonical isoforms and lies in an intrinsically disordered stretch that separates the second and third calpain-binding units of the protein	RP3Calpastatin	In catalog
Domains 4A of the long isoform (all isoforms)	~600–640 (approximate A-subregion of inhibitory domain 4, near the C-terminal end of the canonical long isoform) Region corresponding to the A-subregion of inhibitory domain 4, the most C-terminal of the four tandem calpain-inhibitory units in the human calpastatin long isoform; subregion A of each domain contributes to docking onto the calpain small subunit (CAPNS1) and is conserved across all long-form isoforms	RP4Calpastatin	In catalog
—	1–708 Region spanning the central multi-domain architecture of human calpastatin, encompassing structural elements across the L-domain and inhibitory domains 1 through 4; this broad epitope coverage is suited for detection of the full-length protein across multiple isoforms and species orthologs without isoform selectivity	RP-Calpastatin	In catalog

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
------	---------	----------------	-------

WB	Validated- Human Potenti al-Mouse, Dog	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

Calpastatin (CAST, UniProt P20810) is the sole known endogenous proteinaceous inhibitor of the calpain family of calcium-dependent cysteine proteases (EC 3.4.22.-). It is a modular, intrinsically disordered protein whose inhibitory activity is strictly specific for calpains; no other protease family is targeted. The human CAST gene encodes multiple isoforms generated by alternative splicing and alternative promoter usage, with the canonical long isoform containing an N-terminal L-domain followed by four tandem inhibitory domains (domains 1–4). Each inhibitory domain is capable of independently binding and blocking one calpain molecule.

Expression & Localisation

Calpastatin is ubiquitously expressed but shows markedly elevated levels in skeletal and cardiac muscle, erythrocytes, and platelets — tissues with high calpain activity. A testis-specific short isoform (encoded by an internal promoter) lacks the L-domain and domains 1–2, and is expressed predominantly in spermatogenic cells. The protein lacks a classical signal peptide or transmembrane domain and resides predominantly in the cytosol. Calcium-dependent translocation to membranes and mitochondria-associated fractions has been reported, mirroring the calcium-triggered membrane recruitment of calpain itself.

Inhibition Mechanism

Calpastatin inhibition of calpain is strictly calcium-dependent: in the absence of calcium, calpastatin binds calpain only weakly, whereas elevated intracellular calcium promotes conformational changes in both partners that stabilise a high-affinity inhibitory complex. Each inhibitory domain contains three conserved subregions (A, B, C). Subregion B carries the primary inhibitory motif that contacts the active site cleft of the calpain catalytic subunit; subregions A and C provide additional contacts with the regulatory calpain small subunit (CAPNS1). This tripartite docking architecture allows calpastatin to achieve potent, reversible inhibition without covalent modification of the enzyme.

Key Substrates & Regulatory Context

Because calpastatin does not itself cleave substrates, its functional output is defined by the substrates it protects from calpain-mediated limited proteolysis. Principal calpain substrates regulated by the calpain-calpastatin axis include spectrin, talin, filamin, troponin I and T, desmin, focal adhesion kinase, and the cytoplasmic tails of integrins. By modulating calpain activity, calpastatin indirectly governs cytoskeletal remodelling, integrin-mediated signalling, myofibril turnover, and receptor shedding. The stoichiometric ratio of calpastatin to calpain in a given tissue is a primary determinant of net calpain activity and proteolytic flux.

Disease Relevance

Dysregulation of the calpain-calpastatin axis is implicated in a broad spectrum of pathologies. In muscular dystrophies, reduced calpastatin expression or elevated calpain activity contributes to accelerated myofibrillar degradation. In cardiac ischemia-reperfusion injury, calpain hyperactivation following calcium overload is insufficiently restrained when calpastatin levels are depleted. Neurodegeneration research has identified calpain-mediated cleavage of cytoskeletal proteins as a downstream effector in excitotoxic injury, with calpastatin overexpression conferring neuroprotection in several animal models. In livestock biology, the calpain-calpastatin balance is a well-established determinant of postmortem meat tenderness, making CAST a target for both agricultural and biomedical investigation.

Isoform Diversity & Research Utility

Alternative splicing and use of tissue-specific promoters generate at least two dozen CAST transcript variants in humans. The canonical long isoform (~80–110 kDa apparent molecular weight on SDS-PAGE, reflecting anomalous migration of the intrinsically disordered protein) is broadly expressed. The testis-specific short isoform (the Sperm BS-17 component) migrates closer to ~17–20 kDa. Isoform-selective antibodies are therefore valuable for discriminating expression patterns across tissues, developmental stages, and disease states. Domain-specific reagents further allow researchers to assess isoform composition and potential proteolytic truncation of calpastatin that can itself be a calpain substrate under conditions of sustained calcium elevation.

Gene & Protein Reference

Gene Symbol	CAST
HGNC	HGNC:1472
NCBI Gene ID (Human)	820
NCBI Gene ID (Mouse)	12336
Ensembl	ENSG00000153113
OMIM	114090
UniProt (Human)	P20810
UniProt (Mouse)	P51660
Protein Family	Calpain inhibitor family
Predicted MW	76 kDa (canonical long isoform, 708 aa); ~17–20 kDa (testis short isoform)
Observed MW	80–110 kDa (long isoform, anomalous SDS-PAGE migration due to intrinsic disorder); ~17–20 kDa (testis isoform)
Chromosome	5q15

Paralogue	No close paralogues; functionally unique among endogenous calpain inhibitors
Key Substrates	N/A — CAST is an inhibitor, not a protease; protects calpain substrates including spectrin, talin, filamin, troponin I/T, desmin, FAK, and integrin cytoplasmic tails
Activated by	Not applicable (inhibitor protein); inhibitory complex formation is calcium-dependent
Inhibited by	Calpastatin itself is a calpain substrate under sustained calcium overload conditions; no physiological small-molecule inhibitor of CAST is established

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

FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES.

Product specifications subject to change. Contact Triple Point Biologics for current product and availability information.