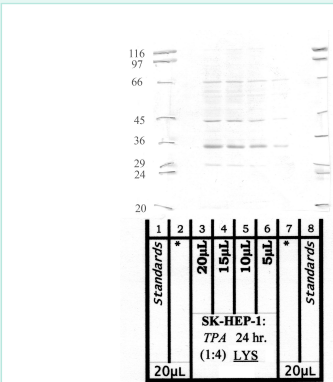


Anti-CPNS1 Rabbit Polyclonal Antibody

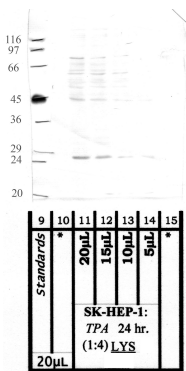
Calpain small subunit 1, CSS1, Calcium-activated neutral proteinase small subunit, CANP small subunit, Calcium-dependent protease small subunit, CDPS, Calcium-dependent protease small subunit 1, Calpain regulatory subunit,

Gene: CPNS1 **UniProt:** P04632 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



Aminoterminal end Domain-V, Small subunit
RP1CalpainS1



Carboxyterminal end Domain-V, Small subunit
RP2CalpainS1



Aminoterminal end Domain-VI, Small subunit
RP3CalpainS1

— Western Blot (4-panel validation across domain-specific antibody clones)

Actual Western blot validation for anti-CPNS1 rabbit polyclonal antibody. 4-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-CPNS1 Rabbit Polyclonal Antibody
Gene Symbol	CPNS1
Alternative Names	Calpain small subunit 1, CSS1, Calcium-activated neutral proteinase small subunit, CANP small subunit, Calcium-dependent protease small subunit, CDPS, Calcium-dependent protease small subunit 1, Calpain regulatory subunit,
UniProt ID	P04632
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-calpain-s1-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CPNS1. 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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Aminoterminal end Domain-V, Small subunit	1–51 Region within the N-terminal portion of Domain V of human CAPNS1, a glycine-rich hydrophobic segment that precedes the core membrane-anchoring region of the small subunit	RP1CalpainS1	In catalog
Carboxyterminal end Domain-V, Small subunit	218–268 Region spanning the C-terminal portion of Domain V of human CAPNS1, encompassing the hydrophobic stretch implicated in membrane insertion and the linker connecting Domain V to the penta-EF-hand Domain VI	RP2CalpainS1	In catalog
Aminoterminal end Domain-VI, Small subunit	1–51 Region within the N-terminal half of Domain VI (penta-EF-hand domain) of human CAPNS1, containing the first two to three EF-hand calcium-binding motifs that contribute to heterodimer stabilization and calcium sensing	RP3CalpainS1	In catalog
Carboxyterminal end Domain-VI, Small subunit	218–268 Region spanning the C-terminal half of Domain VI of human CAPNS1, encompassing the fourth and fifth EF-hand motifs and the paired EF-hand interface that directly contacts the homologous C-terminal PEF domain of the large calpain catalytic subunit	RP4CalpainS1	In catalog
—	1–268 Broad-coverage antigen spanning both Domain V (glycine-rich N-terminal membrane-anchoring region) and Domain VI (penta-EF-hand calcium-binding domain) of the full-length human CAPNS1 small subunit, suitable for detection of total CAPNS1 regardless of conformational state	RP-CalpainS1	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)
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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

Calpain System Overview

Calpains are a family of calcium-dependent, non-lysosomal cysteine proteases that catalyze selective, limited proteolysis of target substrates rather than bulk protein degradation. The two ubiquitously expressed isoforms, μ -calpain (CAPN1) and m-calpain (CAPN2), are heterodimers each composed of a distinct large catalytic subunit and the shared regulatory small subunit, CPNS1. This shared small subunit is indispensable for the stability and activity of both conventional calpains, placing CPNS1 at the center of calcium-regulated proteolytic signaling across virtually all mammalian tissues.

Protein Structure and Domain Architecture

Human CPNS1 (UniProt P04632) is a 268-amino acid protein organized into two principal domains. Domain V, spanning roughly the N-terminal ~80 residues, is glycine-rich and hydrophobic; it mediates membrane association and contributes to anchoring of the holoenzyme at the plasma membrane upon calcium activation. Domain VI (~residues 85–268) contains five EF-hand calcium-binding motifs arranged in a penta-EF-hand (PEF) fold that is also present in the C-terminal domain of the large calpain subunit, and this paired PEF interaction forms the primary interface stabilizing the heterodimer.

Expression and Subcellular Localisation

CPNS1 is ubiquitously expressed across human tissues, consistent with its role as the shared regulatory subunit for the two conventional calpain isoforms. Under basal cytosolic calcium concentrations the protein resides predominantly in the cytoplasm. Genetic ablation of CPNS1 in mice results in embryonic lethality, demonstrating that the small subunit is essential for development and that neither CAPN1 nor CAPN2 can sustain viability in its absence. Tissue-specific studies show relatively high CPNS1 abundance in skeletal muscle, brain, and platelets, tissues where rapid calpain-mediated remodeling is physiologically important.

Calcium-Dependent Activation and Membrane Translocation

Calpain activation is triggered by elevation of intracellular free calcium. Calcium binding to the EF-hand motifs of both Domain VI of CPNS1 and the homologous domain of the large subunit induces conformational rearrangements that relieve autoinhibition of the catalytic cysteine. This is followed by translocation of the heterodimer to the plasma membrane, where the glycine-rich Domain V of CPNS1 inserts into the lipid bilayer, concentrating the enzyme near membrane-associated substrates and lowering the calcium threshold required for full activity. Phospholipid interactions at the membrane are therefore a critical element of physiological calpain regulation.

Key Substrates and Cellular Functions

Activated calpain heterodimers carrying CPNS1 perform limited proteolysis on a broad set of structural and signaling proteins. Well-characterized substrates include talin, filamin, spectrin, focal adhesion kinase (FAK), and the protein tyrosine kinase Src, implicating calpain in cytoskeletal remodeling and cell migration. Calpain also cleaves signaling mediators such as protein kinase C isoforms, I κ B α , and caspases, linking calcium-dependent proteolysis to apoptosis and NF- κ B pathway regulation. In neurons, calpain-mediated proteolysis of suprachiasmatic nucleus proteins and NMDA receptor subunits underpins synaptic plasticity.

Disease Relevance and Inhibitor Profile

Dysregulated calpain activity—mediated through CAPNS1-containing heterodimers—is implicated in ischemia-reperfusion injury, Alzheimer's disease, muscular dystrophies, diabetic retinopathy, and cancer cell invasion. The endogenous inhibitor calpastatin (CAST) is the only known specific protein inhibitor of calpains; it binds the activated heterodimer and blocks substrate access. Small-molecule inhibitors such as calpeptin, MDL-28170, and PD150606 are used experimentally to dissect calpain function. Because CAPNS1 is shared by both μ - and m-calpain, antibodies that target this subunit provide a means to detect total conventional calpain regulatory capacity in cells and tissues.

Gene & Protein Reference

Gene Symbol	CPNS1
HGNC	CAPNS1 (HGNC:1482)
NCBI Gene ID (Human)	826
NCBI Gene ID (Mouse)	12336
Ensembl	ENSG00000126247
OMIM	114170
UniProt (Human)	P04632
UniProt (Mouse)	O88456
Protein Family	Calpain small (regulatory) subunit family; cysteine protease superfamily (C02 family, MEROPS)
Predicted MW	~28.3 kDa (268 aa, human)
Observed MW	~28–30 kDa by SDS-PAGE
Chromosome	19q13.12 (human)
Paralogue	CAPNS2 (calpain small subunit 2)
Key Substrates	Talin, filamin A, spectrin, FAK, Src, protein kinase C isoforms, I κ B α , caspase-3 (via μ /m-calpain holoenzyme)
Activated by	Elevated intracellular Ca ²⁺ ; phospholipid (membrane) interaction; autolytic processing (lowers Ca ²⁺ requirement)
Inhibited by	Calpastatin (endogenous); calpeptin, MDL-28170 (calpain inhibitor III), PD150606 (experimental small molecules)

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.