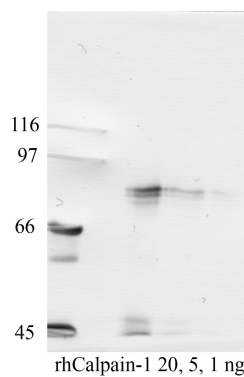


Anti-CAPN1 Rabbit Polyclonal Antibody

Calpain-1 catalytic subunit, EC 3.4.22.52, Calcium-activated neutral proteinase 1, CANP 1, Calpain mu-type, Calpain-1 large subunit, Cell proliferation-inducing gene 30 protein, Micromolar-calpain, muCANP,

Gene: CAPN1 **UniProt:** P07384 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



Domain-I, large subunit
RP2Calpain1

— Western Blot (1-panel validation)

Actual Western blot validation for anti-CAPN1 rabbit polyclonal antibody. 1-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-CAPN1 Rabbit Polyclonal Antibody
Gene Symbol	CAPN1
Alternative Names	Calpain-1 catalytic subunit, EC 3.4.22.52, Calcium-activated neutral proteinase 1, CANP 1, Calpain mu-type, Calpain-1 large subunit, Cell proliferation-inducing gene 30 protein, Micromolar-calpain, muCANP,
UniProt ID	P07384
Host Species	Rabbit
Clonality	Polyclonal (pAb)
Isotype	IgG
Concentration	1mg/ml
Purity	Affinity purified
Pack Size	100ug
Validated Application	WB, EP
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-1-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CAPN1. 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-I, large subunit	2–52 Region spanning the extreme N-terminal portion of Domain I of the CAPN1 large subunit, within the short regulatory segment that precedes the papain-fold protease core of Domain II and is subject to autolytic cleavage upon calpain activation	RP1Calpain1	In catalog
Domain-I, large subunit	2–54 Region encompassing the full extent of Domain I (N-terminal anchor domain) of the CAPN1 large subunit, a short, largely unstructured segment that precedes the catalytic Domain II and undergoes limited autoproteolysis as part of the calcium-dependent activation mechanism	RP2Calpain1	In catalog
Domain IV, large subunit	543–713 Region within Domain IV of the CAPN1 large subunit, the penta-EF-hand (PEF) calcium-binding module situated C-terminal to the C2-like Domain III and responsible for heterodimerization with the paired PEF domain of the regulatory small subunit CAPNS1	RP3Calpain1	In catalog
Carboxyterminal end of Domain IV, large subunit	664–714 Region at the C-terminal extreme of Domain IV (penta-EF-hand module) of the CAPN1 large subunit, adjacent to the fifth EF-hand motif and the dimerization interface with CAPNS1, representing the very end of the mature catalytic subunit sequence	RP4Calpain1	In catalog
—	2–714 Broad-coverage immunogen spanning multiple domains of the CAPN1 large subunit (Domains I–IV), designed to detect total Calpain-1 catalytic subunit irrespective of autolytic processing state or calcium-dependent conformational changes	RP-Calpain1	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

Calpain Family & Calpain-1 Overview

Calpain-1 (CAPN1, EC 3.4.22.52) belongs to the calpain superfamily of intracellular, calcium-dependent cysteine proteases. Unlike lysosomal cathepsins, which mediate bulk protein degradation, calpains perform highly selective, limited proteolytic cleavage events that modulate the function, localization, or stability of target proteins rather than destroying them outright. The human genome encodes at least 15 calpain-related proteins; Calpain-1 and Calpain-2 are the two ubiquitous, well-characterized 'classical' isoforms, distinguished primarily by their calcium concentration requirements for half-maximal activity in vitro.

Protein Architecture

The CAPN1 catalytic subunit is 714 amino acids in length and organized into four domains. Domain I (N-terminal, roughly residues 1–80) serves a regulatory and autolytic role. Domain II (residues ~80–340) contains the papain-fold protease core harboring the catalytic triad (Cys-105, His-262, Asn-286 in human CAPN1). Domain III (~residues 341–490) adopts a C2-like beta-sandwich fold implicated in phospholipid and calcium binding. Domain IV (~residues 491–714) is a penta-EF-hand (PEF) module that mediates heterodimerization with the small regulatory subunit CAPNS1, which itself carries a paired PEF domain.

Calcium Activation & Autolysis

Calpain-1 is classified as mu-calpain because it requires micromolar calcium concentrations (3–50 μ M) for half-maximal activity in vitro, in contrast to Calpain-2 (milli-calpain), which requires millimolar calcium. Calcium binding to Domain IV and to Domain II triggers conformational rearrangements that align the catalytic triad and open the substrate-binding cleft. In cell-based systems, transient and localized calcium signals — such as those generated at the plasma membrane following integrin engagement or receptor activation — are sufficient to activate calpain locally. Limited autolytic cleavage of Domain I further potentiates activity and is regarded as a hallmark of in vivo calpain activation.

Expression & Subcellular Localization

CAPN1 is expressed ubiquitously across human tissues, with relatively high levels detected in skeletal muscle, platelets, erythrocytes, and neurons. At steady state, Calpain-1 resides predominantly in the cytoplasm, but translocates to the plasma membrane or cytoskeletal compartments upon calcium elevation, where its physiologically relevant substrates are concentrated. Association with the small subunit CAPNS1 is required for full stability and regulated activity of the heterodimer in vivo. Membrane phospholipids, particularly phosphatidylinositol 4,5-bisphosphate, lower the calcium threshold needed for membrane-associated calpain activity.

Key Substrates & Biological Roles

Calpain-1 cleaves a functionally diverse substrate repertoire including talin, spectrin, filamin, focal adhesion kinase (FAK), and ezrin, thereby remodeling integrin-based adhesion complexes during cell migration. Additional substrates include the transcriptional repressor CTBP1 (cleaved at multiple sites) and caspase-7, linking calpain activity to apoptotic signaling. In platelets, Calpain-1-mediated cleavage of cytoskeletal proteins contributes to shape change and aggregation. Growth factor

receptors, kinases, and phosphatases are also subject to calpain-mediated processing, placing CAPN1 at the intersection of proliferation and differentiation signaling.

Disease Relevance & Inhibitor Profile

Dysregulated Calpain-1 activity is implicated in a spectrum of pathological states. In neurodegenerative disease, excessive calpain activation driven by calcium dysregulation contributes to cytoskeletal breakdown and neuronal death. In cardiac and skeletal muscle, pathological calpain activity accompanies ischemia-reperfusion injury and muscular dystrophies. CAPN1 loss-of-function variants have been associated with spinocerebellar ataxia (OMIM 615, SCAR8). The endogenous inhibitor calpastatin (CAST) is the primary physiological brake on calpain activity, binding with high specificity to both Calpain-1 and Calpain-2. Synthetic small-molecule inhibitors such as calpeptin and PD150606 are widely used as research tools to dissect calpain-dependent pathways.

Gene & Protein Reference

Gene Symbol	CAPN1
HGNC	HGNC:1476
NCBI Gene ID (Human)	823
NCBI Gene ID (Mouse)	12333
Ensembl	ENSG00000014216
OMIM	114220
UniProt (Human)	P07384
UniProt (Mouse)	O35350
Protein Family	Calpain superfamily; classical calpain subfamily (heterodimeric, ubiquitous)
Predicted MW	~82 kDa (714 aa catalytic subunit)
Observed MW	~80–84 kDa by SDS-PAGE (may shift upon autolytic processing of Domain I)
Chromosome	11q13.1
Paralogue	CAPN2 (Calpain-2 large subunit; milli-calpain)
Key Substrates	Talin, spectrin, filamin A, FAK, ezrin, CTBP1, caspase-7, fodrin, integrin beta subunits
Activated by	Calcium (µM range); membrane phosphoinositides lower the activation threshold; autolytic Domain-I cleavage potentiates activity
Inhibited by	Calpastatin (CAST; endogenous); calpeptin, PD150606, MDL-28170, E-64 (research tool compounds)

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.