Anti-CAPN10 Rabbit Polyclonal Antibody

Calpain-10, EC 3.4.22.-, Calcium-activated neutral proteinase 10, CANP 10,

Gene: CAPN10 **UniProt:** Q9HC96 **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-CAPN10 Rabbit Polyclonal Antibody
Gene Symbol	CAPN10
Alternative Names	Calpain-10, EC 3.4.22.-, Calcium-activated neutral proteinase 10, CANP 10,
UniProt ID	Q9HC96
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-10-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CAPN10. 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

Catalytic Domain (Domain-II).	**1–672** Region spanning the catalytic Domain II of human CAPN10, which houses the conserved Cys-His-Asn catalytic triad characteristic of clan CA cysteine proteases; this domain constitutes the core proteolytic unit of the enzyme and is flanked by the N-terminal Domain I and the C2-like Domain III	RP1Calpain10	In catalog
Domain-III.	**322–494** Region within Domain III of human CAPN10, which adopts a C2-domain-like fold implicated in calcium-dependent membrane association; this domain lies immediately C-terminal to the catalytic Domain II and N-terminal to the divergent Domain T	RP2Calpain10	In catalog
Domain-I (aminoterminal end).	**1–51** Region within the short N-terminal Domain I of human CAPN10, which constitutes the aminoterminal regulatory segment of the polypeptide and precedes the catalytic Domain II; this region is thought to contribute to autoinhibitory contacts in the resting enzyme	RP3Calpain10	In catalog
Domain-T (aminoterminal end)	**1–51** Region within Domain T of human CAPN10, the divergent C-terminal domain that replaces the penta-EF-hand domain found in classical calpains; this domain distinguishes CAPN10 from canonical heterodimeric calpains and is associated with the protein's atypical regulatory properties and inability to associate with the CAPNS1 small regulatory subunit	RP4Calpain10	In catalog
—	**1–672** Immunogen spanning multiple domains of the full-length human CAPN10 polypeptide, encompassing Domain I, the catalytic Domain II, the C2-like Domain III, and the C-terminal Domain T; suitable for broad detection of CAPN10 across experimental contexts where domain-specific epitope bias is not required	RP-Calpain10	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

Family & General Biology

Calpain-10 (CAPN10, UniProt Q9HC96) is a calcium-regulated, non-lysosomal cysteine protease belonging to the calpain superfamily, which comprises 15 members in humans. Unlike the classical calpains (CAPN1/μ-calpain and CAPN2/m-calpain), CAPN10 lacks the penta-EF-hand domain (Domain IV) that mediates heterodimerisation with the regulatory subunit CAPNS1. Instead, it carries a divergent C-terminal region, classifying it among the atypical or 'solo' calpains. The enzyme performs limited, site-specific proteolysis of substrate proteins rather than processive degradation, positioning it as a calcium-dependent signaling modulator rather than a bulk protease.

Domain Architecture

The 672-amino acid CAPN10 polypeptide is organized into four principal domains. Domain I is a short N-terminal regulatory region. Domain II harbors the catalytic dyad (Cys-His-Asn active site) characteristic of clan CA cysteine proteases and constitutes the core proteolytic unit. Domain III adopts a C2-domain-like fold implicated in calcium-dependent membrane association. Domain T (the C-terminal domain) replaces the classical penta-EF-hand domain and shows structural divergence from canonical calpains. This atypical architecture contributes to CAPN10's distinct calcium sensitivity and substrate selectivity relative to the ubiquitous calpains.

Expression & Localisation

CAPN10 is expressed broadly across metabolically active tissues, with notable levels detected in pancreatic islets, skeletal muscle, liver, adipose tissue, and kidney. Within cells, the protease has been reported at multiple compartments including the cytosol, mitochondria, and in association with the cytoskeleton. Mitochondrial localisation is of particular interest given documented effects of CAPN10 activity on mitochondrial morphology and function in insulin-sensitive tissues. Expression is not restricted to any single cell type, consistent with roles in multiple calcium-dependent physiological processes beyond glucose homeostasis.

Activation & Regulation

Like all calpains, CAPN10 requires elevated cytosolic calcium concentrations for proteolytic activity, though its precise calcium threshold has not been as rigorously defined as those of μ- and m-calpain. The enzyme is auto-inhibited in resting conditions, with activation following calcium-induced conformational changes that align the active-site residues. Endogenous calpastatin, the principal physiological inhibitor of classical calpains, displays reduced potency toward CAPN10 compared with CAPN1 and CAPN2, suggesting that additional or alternative regulatory mechanisms govern CAPN10 activity in vivo. Phosphorylation-dependent and lipid-mediated regulatory inputs have also been proposed.

Key Substrates & Cellular Functions

Identified CAPN10 substrates include cytoskeletal components such as filamentous actin-associated proteins, as well as mitochondrial proteins relevant to oxidative metabolism. In insulin-secreting pancreatic β-cells, CAPN10 has been implicated in the regulation of exocytosis and glucose-stimulated insulin secretion. In skeletal muscle and adipocytes, the protease modulates insulin-stimulated GLUT4 translocation and glucose uptake through limited cleavage of vesicle-trafficking and cytoskeletal proteins. These substrate interactions place CAPN10 at the intersection of calcium signaling, cytoskeletal dynamics, and metabolic hormone action.

Disease Relevance

CAPN10 gained prominence as the first type 2 diabetes (T2D) susceptibility gene identified through positional cloning in a genome-wide linkage study of Mexican-American families. Several intronic single-nucleotide polymorphisms (SNPs) — notably UCSNP-43, UCSNP-19, and UCSNP-63 — have been associated with altered CAPN10 expression and T2D risk across diverse ethnic populations, though effect sizes and replication have varied. Mechanistically, reduced CAPN10 activity in muscle and adipose tissue correlates with impaired insulin-stimulated glucose disposal. Beyond metabolic disease, altered calpain-10 activity has been reported in contexts of mitochondrial dysfunction, neurodegeneration, and certain cancers, broadening its biomedical relevance.

Gene & Protein Reference

Gene Symbol	CAPN10
HGNC	HGNC:1340
NCBI Gene ID (Human)	11132
NCBI Gene ID (Mouse)	68986
Ensembl	ENSG00000142178
OMIM	605286
UniProt (Human)	Q9HC96
UniProt (Mouse)	Q9Z270
Protein Family	Calpain superfamily; atypical (solo) calpain subfamily
Predicted MW	~74 kDa
Observed MW	~74–80 kDa (SDS-PAGE; may vary by isoform and post-translational modification)
Chromosome	2q37.3
Paralogue	CAPN5, CAPN7 (atypical calpain subgroup)
Key Substrates	Actin-associated cytoskeletal proteins; mitochondrial inner membrane proteins; vesicle-trafficking regulators involved in GLUT4 translocation
Activated by	Elevated cytosolic Ca²■; calcium-induced conformational rearrangement of Domain II active site
Inhibited by	Calpastatin (partial; reduced potency vs. CAPN1/CAPN2); synthetic calpain inhibitors (e.g., PD150606, MDL-28170)

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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