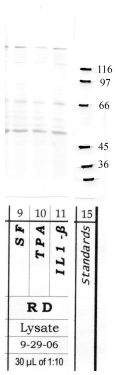
Anti-CAPN15 Rabbit Polyclonal Antibody

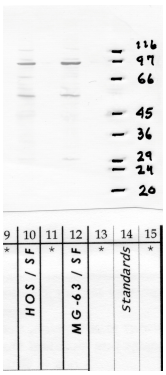
Calpain-15, EC 3.4.22.-, Small optic lobes homolog,

Gene: CAPN15 **UniProt:** O75808 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



Domain-I, large subunit
RP1Calpain15



Acidic loop, zinc finger domain
RP2Calpain15

carboxy end of the Zinc Finger Domain
RP3Calpain15

— Western Blot (5-panel validation across domain-specific antibody clones)

Actual Western blot validation for anti-CAPN15 rabbit polyclonal antibody. 5-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-CAPN15 Rabbit Polyclonal Antibody
Gene Symbol	CAPN15
Alternative Names	Calpain-15, EC 3.4.22.-, Small optic lobes homolog,
UniProt ID	O75808
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-Mouse, Rat, Monkey, 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-calpain-15-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CAPN15. 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

Domain-I, large subunit	**1–486** Region within the N-terminal Domain-I of the CAPN15 large subunit, encompassing the ubiquitin-binding module that mediates recognition of polyubiquitin chains and is structurally distinct from the downstream catalytic core	RP1Calpain15	In catalog
Acidic loop, zinc finger domain.	**~490–560** Region spanning the acidic loop embedded within the zinc finger domain of CAPN15, a structural element that coordinates zinc via conserved cysteine and histidine residues and is absent from classical calpain family members	RP2Calpain15	In catalog
carboxy end of the Zinc Finger Domain.	**1036–1086** Region at the carboxy-terminal boundary of the zinc finger domain, positioned immediately upstream of the linker region connecting the zinc finger to the SOL homology domain, within a segment that contributes to the structural integrity of the zinc-coordinating fold	RP3Calpain15	In catalog
amino end of the SOL Domain.	**1–51** Region at the amino-terminal entry point of the SOL (Small optic lobes) homology domain, a structural element unique to the atypical calpain sub-family that is implicated in protein–protein interactions and substrate selectivity	RP4Calpain15	In catalog
carboxy end of the SOL Domain.	**1036–1086** Region at the carboxy-terminal end of the SOL homology domain, representing the structural closing segment of this calpain-specific fold and encompassing the extreme C-terminus of the 1,086-amino acid CAPN15 polypeptide	RP5Calpain15	In catalog
—	**1–1086** Multi-domain immunogen spanning the full-length CAPN15 protein architecture, encompassing Domain-I, the catalytic cysteine protease core, the zinc finger domain with acidic loop, and the SOL homology domain; suitable for detection of multiple epitopes across the native protein	RP-Calpain15	In catalog

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
WB	Validated-Human Potential-Mouse, Rat, Monkey, 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

Calpain-15 (CAPN15) is an atypical member of the calpain superfamily of calcium-dependent cysteine proteases (EC 3.4.22.-). Unlike classical calpains, which are heterodimeric enzymes composed of a large catalytic subunit and a small regulatory subunit, CAPN15 is a large, multi-domain protein of approximately 1,086 amino acids that lacks the conventional small-subunit-binding (CBSW) domain. It is conserved across metazoans and is the human orthologue of the Drosophila Small optic lobes (SOL) protein, a name that reflects the severe neurodevelopmental phenotypes observed upon loss of function in model organisms.

Domain Architecture

CAPN15 harbors a distinctive multi-domain organisation: an N-terminal ubiquitin-binding domain (Domain-I of the large subunit), a central catalytic cysteine protease core, an acidic loop-containing zinc finger domain, and a C-terminal SOL homology (SOL) domain. The zinc finger domain contains a characteristic acidic loop and coordinates zinc through conserved cysteine and histidine residues. The SOL domain, absent from canonical calpains, is a structural hallmark of this atypical calpain sub-family and is thought to mediate protein–protein interactions relevant to substrate selectivity.

Ubiquitin Binding & Activation Mechanism

A defining biochemical property of CAPN15 is its capacity to bind polyubiquitin chains through its N-terminal domain, with a preference for chains of four or more ubiquitin moieties. Both 'Lys-48'- and 'Lys-63'-linked polyubiquitin chains are recognised, placing CAPN15 at the intersection of the ubiquitin system and calcium-regulated proteolysis. Protease activity is stimulated by calcium, consistent with the broader calpain family, yet the requirement for substrate ubiquitination distinguishes CAPN15 from proteasomal and classical calpain pathways. This dual dependence on calcium and ubiquitin provides a coincidence-detection mechanism that may spatially and temporally restrict proteolytic activity.

Key Substrates & Cellular Function

The best-characterised substrate of CAPN15 is E-cadherin (CDH1), a core component of adherens junctions. CAPN15 recognises ubiquitinated E-cadherin within the E-cadherin–catenin complex and cleaves it in a calcium- and ubiquitination-dependent manner, targeting the resultant fragment for lysosomal degradation. This activity regulates cell–cell adhesion and junctional dynamics. Additional putative substrates include P-cadherin (CDH3), doublecortin (DCX), and β-tubulin III (TUBB3), suggesting roles in cytoskeletal organisation and neuronal migration. CAPN15 has also been linked to the modulation of transcription factor levels, including PAX2 and PAX5, during neurodevelopment.

Expression & Localisation

CAPN15 is expressed broadly, with enriched expression documented in neural tissues including the brain and cerebellum, consistent with its developmental roles. Expression has also been detected in the retina and eye. At the subcellular level, the protein associates with regions of the cell relevant to junctional complexes and the endo-lysosomal pathway, reflecting its role in processing substrates destined for lysosomal degradation rather than proteasomal turnover. The non-proteasomal mode of action distinguishes CAPN15-mediated proteolysis from canonical ubiquitin–proteasome pathway substrates.

Disease Relevance

Loss-of-function studies in model organisms demonstrate that CAPN15 is essential for normal eye and brain development, producing small or disorganised optic lobes when disrupted. In humans, CAPN15 variants have been associated with neurodevelopmental disorders, and the protein's role in adherens junction regulation implicates it in processes relevant to tumour biology, given that E-cadherin loss is a hallmark of epithelial–mesenchymal transition. Dysregulation of CAPN15-mediated proteolysis of junctional and cytoskeletal substrates may contribute to defects in neuronal migration, tissue morphogenesis, and epithelial integrity.

Gene & Protein Reference

Gene Symbol	CAPN15
HGNC	HGNC:1490
NCBI Gene ID (Human)	57650
NCBI Gene ID (Mouse)	57520
Ensembl	ENSG00000145681
OMIM	605718
UniProt (Human)	O75808
UniProt (Mouse)	Q9Z1P7
Protein Family	Calpain family (atypical, SOL sub-family); cysteine protease superfamily (EC 3.4.22.-)
Predicted MW	~120 kDa (1,086 aa)
Observed MW	~120–130 kDa (SDS-PAGE; may vary with post-translational modification)
Chromosome	16q22.1 (human)
Paralogue	CAPN5 (most closely related atypical calpain; both harbour SOL domain)
Key Substrates	E-cadherin (CDH1), P-cadherin (CDH3), Doublecortin (DCX), β-Tubulin III (TUBB3)
Activated by	Calcium (Ca^{2+}); polyubiquitinated substrate recognition (Lys-48 and Lys-63 chains)
Inhibited by	Calpain inhibitors targeting the cysteine protease active site (e.g. calpeptin, ALLN/N-Ac-Leu-Leu-Nle-CHO); specific endogenous inhibitor not firmly 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

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