Anti-CPA2 Rabbit Polyclonal Antibody

Carboxypeptidase A2, EC 3.4.17.15,

Gene: CPA2 **UniProt:** P48052 **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-CPA2 Rabbit Polyclonal Antibody
Gene Symbol	CPA2
Alternative Names	Carboxypeptidase A2, EC 3.4.17.15,
UniProt ID	P48052
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-carboxypeptidase-a2-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of CPA2. 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

Propeptide domain	**19–114** Region spanning the N-terminal activation (pro)segment of human CPA2, which occludes the active site cleft in the zymogen and is released by tryptic cleavage at approximately Arg94 in the duodenal lumen to yield the mature enzyme	RP1CarboxypeptidaseA2	In catalog
Metalloproteinase domain	**122–414** Region within the mature catalytic domain of human CPA2, encompassing the zinc-coordinating active site, the S1' aromatic substrate-binding pocket, and the C-terminal globular fold characteristic of the M14A metallocarboxypeptidase family	RP2CarboxypeptidaseA2	In catalog
—	**115–419** Immunogen spanning both the propeptide activation segment and the mature metallocarboxypeptidase catalytic domain of human CPA2, providing broad epitope coverage of the full-length zymogen precursor	RP-CarboxypeptidaseA2	In catalog
Metalloproteinase domain	Metalloproteinase domain	RP3CarboxypeptidaseA2	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

Carboxypeptidase A2 (CPA2; EC 3.4.17.15) is a zinc-dependent metalloexopeptidase of the M14A subfamily, which also encompasses CPA1, CPA3, CPB1, and CPB2. Like all M14A members, CPA2 coordinates a catalytic zinc ion through two histidine residues and a glutamate, with a conserved glutamate serving as the general base during peptide bond hydrolysis. The enzyme excises single amino acids from the free carboxyl terminus of peptide substrates and is distinguished within the A-type carboxypeptidases by a pronounced preference for bulky aromatic residues — phenylalanine, tyrosine, and tryptophan — at the P1' position, a specificity contrast with CPA1, which favors aliphatic side chains.

Zymogen Activation

CPA2 is synthesized in pancreatic acinar cells as an inactive precursor, procarboxypeptidase A2 (pro-CPA2), in which an N-terminal propeptide of approximately 94 residues occludes the active site and prevents substrate access. Activation occurs in the duodenal lumen upon tryptic cleavage of the Arg94–Ala95 bond (human numbering), releasing the propeptide and generating the mature 325-residue active enzyme. The isolated propeptide has been shown to act as a competitive inhibitor of the mature enzyme in vitro, a property exploited in structural studies of the S1' specificity pocket. In vivo, this regulated activation prevents intracellular autodigestion.

Expression & Localisation

CPA2 expression is highly restricted to the exocrine pancreas under normal physiological conditions. Within the pancreas, CPA2 mRNA and protein are confined to acinar cells, where the zymogen is packaged into secretory zymogen granules alongside other digestive zymogens including trypsinogens, chymotrypsinogens, and proelastases. Upon cholecystokinin-stimulated exocytosis, pro-CPA2 is released into the pancreatic ductal system and subsequently into the duodenum. Transcriptomic databases report low-level CPA2 transcript signals in a small number of non-pancreatic tissues, though functional protein expression outside the exocrine pancreas remains limited and context-dependent.

Substrate Specificity & Catalytic Mechanism

The substrate preference of CPA2 for large hydrophobic and aromatic C-terminal residues is determined primarily by the architecture of the S1' binding pocket, which is wider and more hydrophobic than that of CPA1 due to key substitutions at positions 255 and 268 (chick CPA numbering). The zinc-bound water molecule is activated by Glu270 to execute nucleophilic attack on the scissile peptide bond. Physiological substrates include dietary peptides generated by endopeptidase action on proteins such as casein, gluten, and muscle proteins. CPA2 is inhibited by chelating agents (EDTA, 1,10-phenanthroline) and by potato carboxypeptidase inhibitor, a small proteinaceous inhibitor used extensively in structural studies.

Disease Relevance

Elevated CPA2 activity and antigen levels in serum and peritoneal fluid are associated with acute pancreatitis, where premature intracellular zymogen activation drives acinar cell injury. CPA2 has been evaluated as a serum biomarker in pancreatic pathology, with some studies suggesting utility in distinguishing pancreatic injury from other causes of abdominal pain. In the context of pancreatic ductal adenocarcinoma (PDAC), CPA2 features in multi-marker panels reflecting acinar cell differentiation and loss. The enzyme also appears in proteomic analyses of pancreatic juice, where its presence or absence may inform on ductal obstruction and neoplastic transformation.

Structural Enzymology & Research Utility

CPA2 has served as a tractable model system for mapping carboxypeptidase specificity determinants through X-ray crystallography of both the zymogen and mature enzyme forms, as well as inhibitor-bound complexes. The well-resolved propeptide–active-site interface makes pro-CPA2 a reference structure for studying zymogen inhibition mechanisms in the M14 family. Antibodies directed against defined domains — propeptide, catalytic domain, or spanning both — support detection in Western blot, immunohistochemistry, and immunofluorescence formats, enabling discrimination between the zymogen and activated forms in tissue sections and cell lysates when appropriately validated.

Gene & Protein Reference

Gene Symbol	CPA2
HGNC	HGNC:2296
NCBI Gene ID (Human)	1358
NCBI Gene ID (Mouse)	75452
Ensembl	ENSG00000158516
OMIM	114852
UniProt (Human)	P48052
UniProt (Mouse)	Q9WVJ9
Protein Family	Peptidase M14A (metallocarboxypeptidase A) family
Predicted MW	47 kDa (pro-CPA2, 419 aa); ~36 kDa (mature enzyme, ~325 aa)
Observed MW	~47 kDa (zymogen); ~36–38 kDa (mature form) by SDS-PAGE
Chromosome	7q32.2
Paralogue	CPA1 (Carboxypeptidase A1)
Key Substrates	C-terminal aromatic/large hydrophobic residues (Phe, Tyr, Trp) on dietary peptides derived from casein, gluten, and muscle proteins
Activated by	Trypsin (cleavage of pro-segment at Arg94–Ala95 in the duodenal lumen)
Inhibited by	EDTA, 1,10-phenanthroline (chelators); potato carboxypeptidase inhibitor (PCI); latent propeptide (competitive)

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.