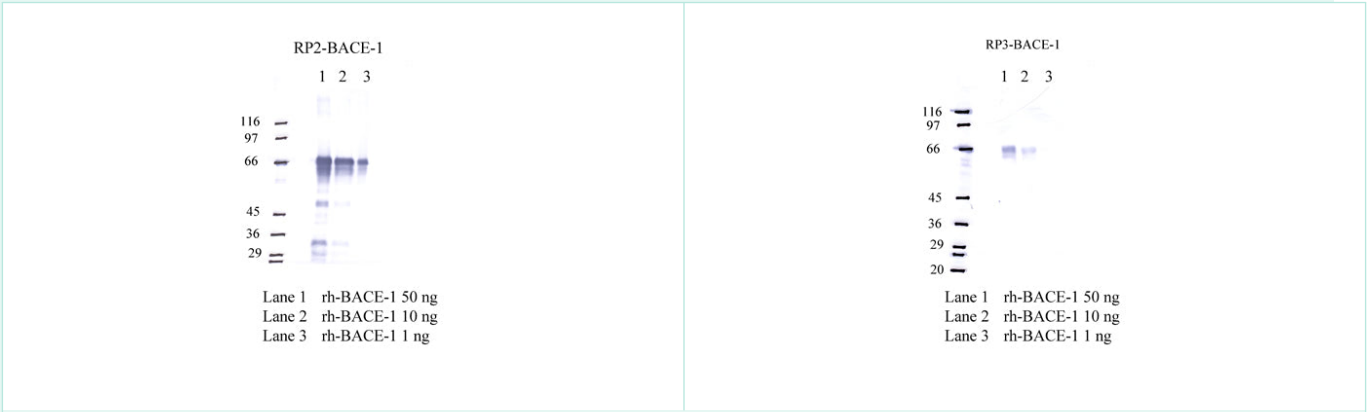
Anti-BACE1 Rabbit Polyclonal Antibody

Beta-secretase 1, EC 3.4.23.46, Aspartyl protease 2, ASP2, Asp 2, Beta-site amyloid precursor protein cleaving enzyme 1, Beta-site APP cleaving enzyme 1, Memapsin-2, Membrane-associated aspartic protease 2,

Gene: BACE1 **UniProt:** P56817 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image



Stalk region
RP2BACE1

Cytoplasmic domain
RP3BACE1

— Western Blot (2-panel validation across domain-specific antibody clones)

Actual Western blot validation for anti-BACE1 rabbit polyclonal antibody. 2-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-BACE1 Rabbit Polyclonal Antibody
Gene Symbol	BACE1
Alternative Names	Beta-secretase 1, EC 3.4.23.46, Aspartyl protease 2, ASP2, Asp 2, Beta-site amyloid precursor protein cleaving enzyme 1, Beta-site APP cleaving enzyme 1, Memapsin-2, Membrane-associated aspartic protease 2,
UniProt ID	P56817
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, Pan, 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-bace1-rabbit-polyclonal-antibody-catalytic

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of BACE1. 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	**75–416** Region within the bilobal catalytic ectodomain of mature human BACE1, encompassing both the N-terminal and C-terminal lobes of the aspartic proteinase fold; this region contains the two catalytic Asp-Thr-Gly motifs characteristic of clan AA proteinases and the substrate-binding cleft that accommodates APP and other type-I membrane protein substrates	RP1BACE1	In catalog
Stalk region	**438–457** Region within the juxtamembrane stalk of human BACE1, situated between the C-terminal boundary of the catalytic ectodomain and the single-pass transmembrane helix; this short linker segment is the site of ectodomain shedding that releases soluble BACE1 (sBACE1) into the extracellular space and cerebrospinal fluid	RP2BACE1	In catalog
Cytoplasmic domain	**479–501** Region within the short cytoplasmic C-terminal tail of human BACE1, downstream of the single transmembrane helix; this tail contains a dileucine motif and palmitoylated cysteine residues that govern GGA adaptor-mediated endosomal trafficking, lipid raft association, and the steady-state distribution of BACE1 between the trans-Golgi network and early endosomes	RP3BACE1	In catalog
—	**46–501** Epitope spanning multiple structural regions of human BACE1, from the mature N-terminus of the catalytic ectodomain through the stalk and cytoplasmic tail; this broad coverage makes the antibody suitable for detecting the full-length transmembrane protein as well as shed ectodomain forms regardless of which individual domain is accessible in a given application or sample preparation	RPBACE1	In catalog

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
WB	Validated-Human Potential-Mouse, Rat, Pan, Monkey, Dog	1:1000	Validated dilution per Triple Point Biologics. Optimize per lot in each laboratory.

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

Published Validation — Key References

Vassar R, Bennett BD, Babu-Khan S, et al. (1999) β-Secretase cleavage of Alzheimer's amyloid precursor protein by the transmembrane aspartic protease BACE. Science 286(5440): 735–741. PubMed · DOI

Yan R, Bienkowski MJ, Shuck ME, et al. (1999) Membrane-anchored aspartyl protease with Alzheimer's disease β-secretase activity. Nature 402(6761): 533–537. PubMed · DOI

Sinha S, Anderson JP, Barbour R, et al. (1999) Purification and cloning of amyloid precursor protein β-secretase from human brain. Nature 402(6761): 537–540. PubMed

Target Background

Family & General Biology

BACE1 (β-secretase 1) is a type-I single-pass transmembrane aspartic proteinase belonging to the pepsin family (clan AA, family A1). It is synthesised as a zymogen with a short prodomain that is removed in the Golgi by furin-family proprotein convertases, yielding the mature ectodomain. The active site contains the canonical Asp-Thr-Gly catalytic dyad characteristic of aspartic proteinases. A closely related paralogue, BACE2, shares roughly 64% sequence identity in the protease domain but has a distinct substrate profile and predominant expression outside the CNS.

Expression & Localisation

BACE1 is expressed at highest levels in neurons of the central nervous system, with particularly strong expression in cortical and hippocampal pyramidal neurons, cerebellar granule cells, and dorsal root ganglia. Lower but detectable expression occurs in astrocytes, pancreatic β-cells, and kidney. Within neurons, BACE1 traffics through the secretory pathway and is enriched in the trans-Golgi network, early endosomes, and lipid raft microdomains of the plasma membrane — compartments where APP cleavage predominantly occurs. A soluble, shed form of BACE1 (sBACE1) is detectable in cerebrospinal fluid and plasma.

Activation & Zymogen Processing

BACE1 is translated as a ~68 kDa precursor bearing a 21-residue prodomain that maintains the enzyme in a near-inactive state through a mechanism analogous to the "prosegment" blockade of other aspartic proteinases. Furin and related proprotein convertases cleave this prodomain during transit through the Golgi, releasing the mature proteinase. Unlike many extracellular aspartic proteinases, BACE1 is optimally active at mildly acidic pH (4–5), consistent with its activity in endosomal

compartments. N-glycosylation at four sites and palmitoylation of cytoplasmic cysteine residues influence trafficking, stability, and raft association.

Key Substrates & Physiological Roles

The best-characterised substrate is amyloid precursor protein (APP). BACE1 cleaves APP at the β-site (between Met671 and Asp672 in the full-length 770-residue isoform), generating membrane-retained C99 (β-CTF) and the shed N-terminal sAPPβ fragment. Beyond APP, validated substrates include neuregulin-1 (NRG1) and neuregulin-3, linking BACE1 to peripheral myelination and neuromuscular junction development. Additional substrates include close homologue of L1 (CHL1), seizure protein 6 (SEZ6), and voltage-gated sodium channel β-subunits, indicating broad roles in synaptic organisation and axon guidance.

Disease Relevance

BACE1-mediated cleavage of APP is the rate-limiting step in the amyloidogenic pathway. Subsequent γ-secretase processing of C99 releases Aβ40 and Aβ42 peptides that aggregate into the plaques characteristic of Alzheimer's disease (AD). BACE1 protein levels and activity are elevated in the AD brain, and genetic reduction of BACE1 in mouse models abolishes plaque formation and reverses cognitive deficits. These findings made BACE1 a primary drug target; however, clinical BACE1 inhibitors that produced significant Aβ lowering failed in late-stage trials, partly attributable to mechanism-based adverse effects arising from impaired cleavage of NRG1 and other substrates.

Inhibitor Profile

BACE1 is potently inhibited by transition-state analogue peptidomimetics incorporating hydroxyethylamine or statine isosteres that engage both catalytic aspartates. The endogenous protein inhibitor of BACE1, originally described as BACE1 prodomain-derived peptides, has no established physiological small-molecule counterpart. Multiple small-molecule oral inhibitors (e.g., verubecestat, atabecestat, lanabecestat, elenbecestat) were advanced into Phase III trials for AD but discontinued. BACE1 is insensitive to the classic aspartic proteinase inhibitor pepstatin A at physiological concentrations, distinguishing it from lysosomal cathepsins D and E.

Gene & Protein Reference

Gene Symbol	BACE1
HGNC	934
NCBI Gene ID (Human)	23621
NCBI Gene ID (Mouse)	23821
Ensembl	ENSG00000186318
OMIM	604252
UniProt (Human)	P56817
UniProt (Mouse)	P56811
Protein Family	Peptidase family A1 (pepsin family); clan AA aspartic proteinase
Predicted MW	~68 kDa (precursor); ~55 kDa (mature ectodomain after prodomain removal and glycan heterogeneity)
Observed MW	~70–75 kDa on SDS-PAGE (due to N-glycosylation at four Asn residues)

Chromosome	11q23.3
Paralogue	BACE2 (UniProt Q9Y5Z0; ~64% identity in protease domain)
Key Substrates	APP (β-site cleavage generating C99/sAPPβ); Neuregulin-1 (NRG1); Neuregulin-3 (NRG3); SEZ6; CHL1; voltage-gated sodium channel β-subunits (SCN1B, SCN2B)
Activated by	Furin-mediated prodomain cleavage in the Golgi; mildly acidic pH (optimum pH 4–5) in endosomes
Inhibited by	Transition-state peptidomimetic inhibitors (hydroxyethylamine and statine isosteres); clinical candidates including verubecestat, atabecestat, lanabecestat (all discontinued); not appreciably inhibited by pepstatin A at physiological concentrations

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