PRODUCT INFORMATION

BACE1 (human, recombinant)

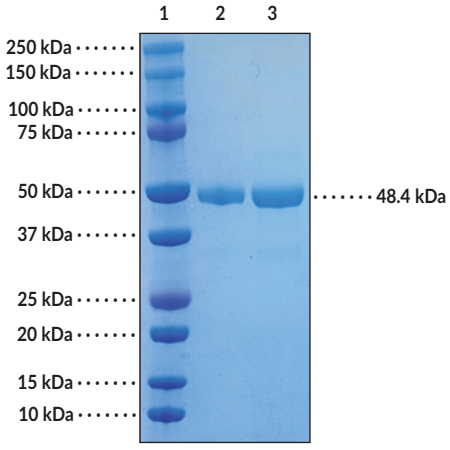
Item No. 14645

Overview and Properties

Synonyms:	β-site Amyloid Precursor Protein Cleaving Enzyme 1, ASP-2, BACE, Memapsin 2, Membrane-bound Aspartic Protease, β-secretase 1
Source:	Active recombinant human C-terminal His-tagged BACE1 expressed in insect cells
Amino Acids:	57-454
Uniprot No.:	P56817
Molecular Weight:	48.4 kDa
Storage:	-80°C (as supplied)
Stability:	≥6 months
Purity:	≥85% estimated by SDS-PAGE
Supplied in:	50 mM HEPES, pH 7.4, with 150 mM sodium chloride and 20% glycerol
Protein Concentration:	***batch specific*** mg/ml
Activity:	***batch specific*** U/ml
Specific Activity:	***batch specific*** U/mg
Unit Definition:	One unit is defined as the amount of enzyme required to produce 1 nmol of EDANS per minute at 25°C in 50 mM sodium acetate, pH 4.5, containing 10 µM fluorogenic β-secretase substrate IV.

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

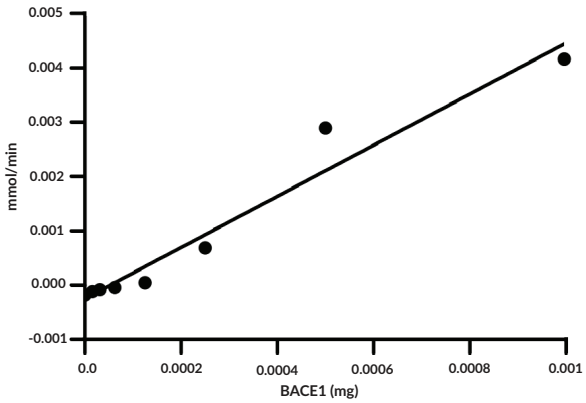
Images



Lane 1: MW Markers
Lane 2: BACE1 (2 µg)
Lane 3: BACE1 (4 µg(

SDS-PAGE Analysis of BACE1.

Representative gel image shown; actual purity may vary between each batch.



BACE1 (human, recombinant) activity was determined using a fluorescence assay. The cleavage of the substrate β-Secretase Substrate IV by BACE1 results in the release of EDANS and a subsequent increase in fluorescence.

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Description

β-Secretase 1 (BACE1) is an aspartic protease and member of the peptidase A1 protease family.[1] BACE1 is transcribed as a preprotein composed of an N-terminal signal peptide, a pro-peptide, a catalytic domain, a transmembrane domain, and a cytosolic domain. The N-terminal signal peptide traffics the BACE1 preprotein to the endoplasmic reticulum where furin-mediated cleavage of the propeptide produces mature BACE1. The transmembrane domain of mature BACE1 drives localization to the Golgi where BACE1 is post-translationally activated and functions at endosomal or Golgi membranes.[1,2] BACE1 is expressed primarily in the brain and at lower levels in pancreatic β-cells, adipocytes, hepatocytes, and vascular cells. BACE1 cleaves amyloid precursor protein (APP) to initiate the generation of amyloid-β (Aβ), and BACE1 knockout rescues memory deficits and cholinergic dysfunction in transgenic mouse models of Alzheimer's disease.[3,4] Additional BACE1 substrates include seizure-related 6 (SEZ6) and seizure-related 6-like (SEZ6L), and BACE1-mediated cleavage of Sez6 and Sez6L is increased in the brain in a mouse model of Niemann-Pick type C disease.[5] Cayman's BACE1 (human, recombinant) protein can be used for enzyme activity assays.

References

1. Taylor, H.A., Przemylska, L., Clavane, E.M., *et al.* BACE1: More than just a β-secretase. *Obes. Rev.* **23(7)**, e13430 (2022).
2. Araki, W. Post-translational regulation of the β-secretase BACE1. *Brain Res. Bull.* **126 (Pt. 2)**, 170-177 (2016).
3. Yan, R., Fan, Q., Zhou, J., *et al.* Inhibiting BACE1 to reverse synaptic dysfunctions in Alzheimer's disease. *Neurosci. Biobehav. Rev.* **65**, 326-340 (2016).
4. Pietrak, B.L., Crouthamel, M.C., Tugusheva, K., *et al.* Biochemical and cell-based assays for characterization of BACE-1 inhibitors. *Anal. Biochem.* **342(1)**, 144-151 (2005).
5. Causevic, M., Dominko, K., Malnar, M., *et al.* BACE1-cleavage of Sez6 and Sez6L is elevated in Niemann-Pick type C disease mouse brains. *PLoS One* **13(7)**, e0200344 (2018).

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