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PRODUCT INFORMATION

SMPD1 (human, recombinant)

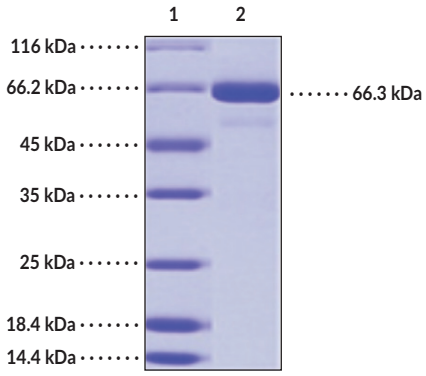
Item No. 41080

Overview and Properties

Synonyms:	Acid Sphingomyelinase, ASM, aSMase, Sphingomyelin Phosphodiesterase 1, Zn-SMase
Source:	Active recombinant human C-terminal His-tagged acid sphingomyelinase expressed in insect cells
Amino Acids:	47-628
Uniprot No.:	P17405
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	≥90% estimated by SDS-PAGE
Supplied in:	Sterile 20 mM Tris, 500 mM sodium cloride, 25% glycerol, pH 7.5
Endotoxin Testing:	<1.0 EU/µg, determined by the LAL endotoxin assay
Protein Concentration:	***batch specific*** mg/ml
Activity:	***batch specific*** U/ml
Specific Activity:	***batch specific*** U/mg

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

Image



Lane 1: MW Markers
Lane 2: SMPD1

SDS-PAGE Analysis of SMPD1. This protein has a calculated molecular weight of 66.3 kDa.

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PRODUCT INFORMATION

Description

Acid sphingomyelinase, also known as sphingomyelin phosphodiesterase 1 (SMPD1), is a lysosomal and secretory phosphodiesterase.[1] *SMPD1*, the gene encoding acid sphingomyelinase, produces three isoforms but only the full-length isoform is further processed into a precursor polypeptide, which is composed of an N-terminal signal peptide, a saposin-like (SAP) domain, a proline-rich domain, a metallophosphoesterase catalytic region, and a C-terminal domain. The precursor polypeptide is subject to post-translational modifications and alternative trafficking, which results in two enzymes: lysosomal sphingomyelinase (L-SMase), which is further cleaved to an N-terminus of Gly66, and secretory sphingomyelinase (S-SMase), which is further cleaved to an N-terminus of His60.[1,2] Both enzymes catalyze the hydrolysis of sphingomyelin into ceramide and phosphocholine.[1] Acid sphingomyelinase is ubiquitously expressed and hydrolyzes sphingomyelin in the endo-lysosome, in lipoproteins, and at the outer leaflet of the plasma membrane.[1,3] It has roles in various cellular processes, including apoptosis, immune cell activation, and inflammation.[2] Mutations in *SMPD1* result in type A and B Niemann-Pick disease, a lysosomal storage disorder characterized by sphingomyelin accumulation in the endo-lysosome and visceral, neurological, and psychiatric symptoms.[4,5] Cayman's SMPD1 (human, recombinant) protein can be used for enzyme activity assay applications. This protein consists of 593 amino acids, has a calculated molecular weight of 66.3 kDa, and a predicted N-terminus of Leu47 after signal peptide cleavage.

References

1. Jenkins, R.W., Canals, D., and Hannun, Y.A. Roles and regulation of secretory and lysosomal acid sphingomyelinase. *Cell Signal.* **21(6)**, 836-846 (2009).
2. Xiang, H., Jin, S., Tan, F., *et al.* Physiological functions and therapeutic applications of neutral sphingomyelinase and acid sphingomyelinase. *Biomed. Pharmacother.* **139**, 111610 (2021).
3. Tani, M., Ito, M., and Igarashi, Y. Ceramide/sphingosine/sphingosine 1-phosphate metabolism on the cell surface and in the extracellular space. *Cell Signal.* **19(2)**, 229-237 (2007).
4. Pfrieger, F.W. The Niemann-Pick type diseases - A synopsis of inborn errors in sphingolipid and cholesterol metabolism. *Prog. Lipid Res.* **90**, 101225 (2023).
5. Pinto, C., Sousa, D., Ghilas, V., *et al.* Acid sphingomyelinase deficiency: A clinical and immunological perspective. *Int. J. Mol. Sci.* **22(23)**, 12870 (2021).

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