

PRODUCT INFORMATION



SMPD1 (human, recombinant)

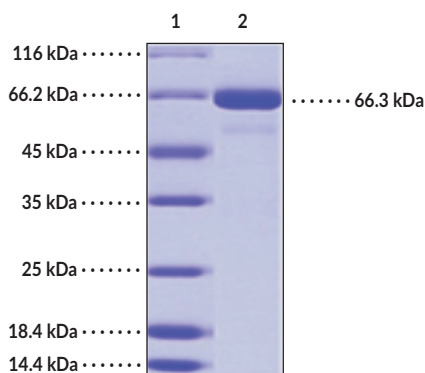
Item No. 41080

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 chloride, 25% glycerol, pH 7.5
Endotoxin Testing:	<1.0 EU/μg, determined by the LAL endotoxin assay
Protein Concentration:	<i>batch specific</i> mg/ml
Activity:	<i>batch specific</i> U/ml
Specific Activity:	<i>batch specific</i> 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.

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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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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