

Recombinant Human ASM Protein

For Research Use Only

1. Basic Product Information

Catalog No.: REP50054

Size: 10ug, 100ug

Protein Name: Sphingomyelin phosphodiesterase (EC 3.1.4.12) (EC 3.1.4.3) (Acid sphingomyelinase) (aSMase) [Cleaved into: Sphingomyelin phosphodiesterase, processed form]

Synonym: SMPD1, ASM

UniProt ID: P17405

UniProt Link: www.uniprot.org/uniprotkb/P17405/entry

Species Source: Human

Expression System: HEK293T eukaryotic cell expression system Sequence

Length: 631 AA

Molecular Weight: 70 KD

Protein Tag: C-terminal His6

2. Amino Acid Sequence

MPRYGASLRQSCPRSGREQGQDGTAGAPGLLWMGLVLALALALALALALSDSRVLWAPAEAHPLS
PQGHPARLHRIVPRLRDVFGWGNLTCPICKGLFTAINLGLKKEPNVARVGSVAIKLCNLLKIAPPAVC
QSIVHLFEDDMVEVWRRSVLSPSEACGLLLGSTCGHWDIFSSWNISLPTVPKPPPKPPSPPAPGAPV
SRILFLTDLHWDHLDYLEGTDPCADPLCCRRGSLPPASRPGAGYWGEYSKCDLPLRTLLESLLSGL
GPAGPFDMVYWTGDIPAHDVWHQTRQDQLRALTTVTALVRKFLGPVPVYPAVGNHSTPVNSFPP
PFIEGNHSSRWLYEAMAKAWEPWLP AEALRTL RIGGFYALSPYPGLRLISLNMNFC SRENFWLLINS
TDPAGQLQWLVLGELQAAEDRGDKVHIIGHIPPGHCLKSWSWNYRIVARYENTLAAQFFGHTHVDE
FEVYDEETLSRPLAVAFLAPSATTYIGLNPGRVYQIDGNYS GSSHVLDHETYILNLTQANIPGAIP
HWQLLYRARETYGLPNTLPTAWHNLVYRMRGDMQLFQTFWFLYHKGHPPEPCGTPCRLATLCAQ
LSARADSPALCRHLMPDGSLPEAQLWPRPLFC

3. Buffer Composition

Liquid format: PBS-based buffer containing 50% glycerol. Glycerol concentration can be customized upon customer request; please state special requirements when placing your order.



Lyophilized format: Buffer before lyophilization is PBS supplemented with 6% trehalose.

4. Storage Conditions

Upon receipt, store the product at -20 °C or -80 °C. Aliquot the product for on-demand use to preserve protein activity and prevent denaturation and inactivation caused by repeated freeze-thaw cycles.

5. Product Description

This product is recombinant Sphingomyelin phosphodiesterase (EC 3.1.4.12) (EC 3.1.4.3) (Acid sphingomyelinase) (aSMase) [Cleaved into: Sphingomyelin phosphodiesterase, processed form] produced using the HEK293T eukaryotic cell expression system. It is suitable for in-vitro functional assays, protein-protein interaction studies, antibody preparation and other biomedical research applications.

Protein Function: Converts sphingomyelin to ceramide (PubMed:12563314, PubMed:1840600, PubMed:18815062, PubMed:25339683, PubMed:25920558, PubMed:27659707, PubMed:33163980). Exists as two enzymatic forms that arise from alternative trafficking of a single protein precursor, one that is targeted to the endolysosomal compartment, whereas the other is released extracellularly (PubMed:20807762, PubMed:21098024, PubMed:9660788). However, in response to various forms of stress, lysosomal exocytosis may represent a major source of the secretory form (PubMed:12563314, PubMed:20530211, PubMed:20807762, PubMed:22573858, PubMed:9393854).; In the lysosomes, converts sphingomyelin to ceramide (PubMed:20807762, PubMed:21098024). Plays an important role in the export of cholesterol from the intraendolysosomal membranes (PubMed:25339683). Also has phospholipase C activities toward 1,2-diacylglycerolphosphocholine and 1,2-diacylglycerolphosphoglycerol (PubMed:25339683). Modulates stress-induced apoptosis through the production of ceramide (PubMed:8706124).; When secreted, modulates cell signaling with its ability to reorganize the plasma membrane by converting sphingomyelin to ceramide (PubMed:12563314, PubMed:17303575, PubMed:20807762). Secreted form is increased in response to stress and inflammatory mediators such as IL1B, IFNG or TNF as well as upon infection with bacteria and viruses (PubMed:12563314, PubMed:20807762, PubMed:9393854). Produces the release of ceramide in the outer leaflet of the plasma membrane playing a central role in host defense (PubMed:12563314, PubMed:20807762, PubMed:9393854). Ceramide reorganizes these rafts into larger signaling platforms that are required to internalize *P.aeruginosa*, induce apoptosis and regulate the cytokine response in infected cells (PubMed:12563314). In wounded cells, the lysosomal form is released extracellularly in the presence of Ca(2+) and promotes endocytosis and plasma membrane repair (PubMed:20530211).; [Sphingomyelin phosphodiesterase, processed form]: This form is generated following cleavage by CASP7 in the extracellular milieu in response to bacterial infection (PubMed:21157428). It shows increased ability to convert sphingomyelin to ceramide and promotes plasma membrane repair (By similarity). Plasma membrane repair by ceramide counteracts the action of gasdermin-D (GSDMD) perforin (PRF1) pores that are formed in response to bacterial infection (By similarity).; (Microbial infection) Secretion is activated by bacteria such as *P.aeruginosa*, *N.gonorrhoeae* and others, this activation results in the release of ceramide in the outer leaflet of the plasma membrane which facilitates the infection.; (Microbial infection) Secretion is activated by human coronaviruses SARS-CoV and SARS-CoV-2 as well as Zaire ebolavirus, this activation results in the release of ceramide in the outer leaflet of the plasma membrane which facilitates the infection.; [Isoform 2]: Lacks residues that bind the cofactor Zn(2+) and has no enzyme activity.; [Isoform 3]: Lacks residues that bind the cofactor Zn(2+) and has no enzyme activity.

Subcellular Localization: Lysosome . Lipid droplet . Secreted . Note=The secreted form is induced in a time- and dose-dependent by IL1B and TNF as well as stress and viral infection. This increase of the secreted form seems to be due to exocytosis of the lysosomal form and is Ca(2+)-dependent (PubMed:20530211, PubMed:20807762, PubMed:22573858). Secretion is dependent of

phosphorylation at Ser-510 (PubMed:17303575). Secretion is induced by inflammatory mediators such as IL1B, IFNG or TNF as well as infection with bacteria and viruses (PubMed:12563314, PubMed:20807762).; [Sphingomyelin phosphodiesterase, processed form]: Secreted, extracellular space . Note=This form is generated following cleavage by CASP7.

6. Notes

- Avoid repeated freeze-thaw cycles to maintain protein stability and biological activity.
- Please specify special buffer-composition requirements at the time of order placement.
- For research use only. Not intended for clinical diagnosis, therapeutic use or commercial manufacturing.