

Product Information

SUMO Protease, Histidine-tagged

Recombinant, expressed in *E. coli*, lyophilized powder

SAE0067

Product Description

Synonyms: Ubiquitin-like-specific protease 1, Ulp1, UBL specific protease 1.

SUMO proteases are a general class of enzymes that specifically remove the post-translational protein modification (PTM) known as small ubiquitin-related modifier (SUMO), which falls into the PTM class of ubiquitin and/or ubiquitin-like proteins (UBL).¹ The enzyme commonly referred to as 'SUMO protease' is the Ubl-specific protease 1 (Ulp1) from *Saccharomyces cerevisiae*. This was the first of this class of enzymes to be isolated.²

SUMO protease specifically cleaves the SUMO moiety in a 'scarless' manner. SUMO protease recognizes the tertiary structure of the Ubiquitin-like SUMO domain and hydrolyzes the peptide bond in the x-Gly-Gly-x sequence after the Gly-Gly bond, at the C-terminus of the SUMO domain.³ In addition to cleavage of natural SUMO-modified proteins, SUMO protease is used to cleave recombinant SUMO fusion proteins. The SUMO domain is a known solubility-enhancing fusion tag that is used in recombinant protein expression.⁴ A histidine tag can also be added at the *N*-terminus of the SUMO domain as a purification tag.⁵

This SUMO protease product carries a 6× Histidine tag. This SUMO protease product can thus be easily removed together with the cleaved SUMO domain, following the digestion reaction. Several publications cite use of SAE0067 in their research.⁶⁻¹⁵

Precautions and Disclaimer

This product is for R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Product

Unit definition: One unit is defined as the amount that will cleave 90% of 100 pmole of SUMO-GST in 1 hour at 30 °C.

Storage/Stability

Store the lyophilized powder at -20 °C. The product is expected to retain activity for at least 2 years when stored at -20 °C.

Preparation Instructions

Store the reconstituted product at -20 °C. It is recommended to reconstitute the enzyme in 100 µL of either water or 50% glycerol (v/v), supplemented with 1 mM DTT. Solutions in water/DTT should be stored in frozen aliquots to avoid freeze-thaw cycles, which can adversely affect the protease activity.

Procedure

SUMO protease is active over a wide range of temperatures (2-30 °C), ionic strengths (0-400 mM NaCl), and pH ranges (6-8.5). However, its activity may vary depending on the substrate and conditions. Researchers will need to optimize their specific reaction conditions.

As an initial suggestion, 20 units of SUMO protease can be used per mg of target protein for 1 hour at 30 °C, or overnight at 2-8 °C. The cleavage efficiency can then be estimated by SDS-PAGE. If necessary, the amount of SUMO protease can then be adjusted.

SUMO protease works better in the presence of reducing agents, such as 0.5-2 mM DTT. DTT in the reaction mixture can significantly enhance cleavage efficiency, especially during longer incubations.

References

1. Hickey, C. M. *et al.*, *Nat. Rev. Mol. Cell Biol.*, 13(12), 755-766 (2012).
2. Li, S. J., and Hochstrasser, M., *Nature*, 398(6724), 246-251 (1999).
3. Li, S. J., and Hochstrasser, M., *J. Cell Biol.*, 160(7), 1069-1082 (2003).
4. Kimple, M. E. *et al.*, *Curr. Protoc. Protein Sci.*, 24, 73:Unit 9.9 (2013).
5. Lee, C.-D. *et al.*, *Protein Sci.*, 17(7), 1241-1248 (2008).
6. Crickard, J. B. *et al.*, *Cell*, 181(6), 1380-1394.e18 (2020).
7. Roy, U. *et al.*, *Mol. Cell*, 81(5), 1043-1057.e8 (2021).
8. Suzuki, S. W. *et al.*, *eLife*, 10, e69883 (2021).
9. Xia, C. *et al.*, *iScience*, 24(10), 103153 (2021).
10. Liu, L. *et al.*, *Adv. Healthc. Mater.*, 10(20), e2100956 (2021).
11. Le Gall, C. *et al.*, *J. Immunother. Cancer*, 10(4), e004309 (2022).
12. Hoelscher, M. P. *et al.*, *Nat. Commun.*, 13(1), 5856 (2022).
13. Mauxion, F. *et al.*, *Cell Rep.*, 42(1), 111902 (2023).
14. Ge, R. *et al.*, *Nat. Protoc.*, 18(2), 626-657 (2023).
15. Peterson, N. D. *et al.*, *Immunity*, 56(4), 766-782.e9 (2023).

Notice

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose.

The information in this document is subject to change without notice and should not be construed as a commitment by the manufacturing or selling entity, or an affiliate. We assume no responsibility for any errors that may appear in this document.

Technical Assistance

Visit the tech service page at SigmaAldrich.com/techservice.

Terms and Conditions of Use

Warranty, use restrictions, and other conditions of sale may be found at SigmaAldrich.com/terms.

Contact Information

For the location of the office nearest you, go to SigmaAldrich.com/offices.

The life science business of Merck operates as MilliporeSigma in the U.S. and Canada.

Merck and Sigma-Aldrich are trademarks of Merck KGaA, Darmstadt, Germany or its affiliates. All other trademarks are the property of their respective owners. Detailed information on trademarks is available via publicly accessible resources.

© 2017-2023 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved.
SAE0067pis Rev 12/23 AB, MP

The Merck logo, consisting of the word "MERCK" in a bold, red, sans-serif font.