

Product Information

Proteinase K from *Tritirachium album*

Free of DNA contaminants, suitable for Microbiome research, lyophilized powder

SAE0151

Product Description

CAS Registry Number: 39450-01-6

Enzyme Commission (EC) Number: 3.4.21.64

Synonym: Peptidase K, Endoproteinase K, ProK, Endopeptidase K, Proteinase K from *Engyodontium album*

Proteinase K is a stable serine protease with broad substrate specificity. It degrades many proteins in the native state even in the presence of detergents. Proteinase K was historically isolated from *Tritirachium album* Limber, a fungus able to grow on keratin, and the enzyme can digest native keratin.¹

Proteinase K belongs to the subtilisin family with an active site catalytic triad (Asp³⁹-His⁶⁹-Ser²²⁴).² The predominant site of cleavage is the peptide bond adjacent to the carboxyl group of aliphatic and aromatic amino acids with blocked α-amino groups. Proteinase K is commonly used for its broad specificity.¹⁻⁴

Proteinase K is frequently used in molecular biology applications to digest unwanted proteins, such as nucleases from DNA or RNA preparations from microorganisms, cultured cells, and plants.⁵⁻¹¹ Proteinase K is usually denatured by subsequent phenol extractions.³

Proteinase K is active in 1% Triton X-100 and in 0.5% (w/v) SDS. SDS and urea will denature protein substrates, enhancing digestion rates. These agents denature Proteinase K itself much more slowly.^{3,12,13}

The study of microbial communities has been revolutionized in recent years by the widespread adoption of culture-independent analytical techniques such as 16S rRNA gene sequencing and metagenomics. Since DNA contamination during sample preparation is a major problem of these sequence-based approaches,¹⁴ DNA extraction reagents free of DNA contaminants are essential.

This Proteinase K product undergoes strict quality control testing to ensure the absence of detectable levels of contaminating DNA, using 35 cycles PCR amplification of 16S and 18S rDNA using universal primer sets.

Precautions and Disclaimer

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

Specific activity: ≥ 30 units/mg protein

Unit definition: One unit will hydrolyze urea denatured hemoglobin to produce color equivalent to 1.0 micromole of tyrosine per minute at pH 7.5, 37 °C (color per Folin-Ciocalteu reagent).

Storage/Stability

Proteinase K stock solutions can be stored at -20 °C in frozen aliquots.

Preparation Instructions

Solutions of Proteinase K can be prepared at 1 mg/mL in DNA-free water.

References

1. Ebeling, W. *et al.*, *Eur. J. Biochem.*, **47**(1), 91-97 (1974).
2. Betzel, C. *et al.*, *Eur. J. Biochem.*, **178**(1), 155-171 (1988).
3. *Enzymes of Molecular Biology*, Vol. 16 (Burrell, M.M., ed.). Humana Press (Totowa, NJ), p. 307 (1993).
4. Kraus, E., and Femfert, U., *Hoppe Seylers Z. Physiol. Chem.*, **357**(7), 937-947 (1976).

5. Lizardi, P.M., and Engelberg, A., *Anal. Biochem.*, **98(1)**, 116-122 (1979).
6. Gross-Bellard, M. *et al.*, *Eur. J. Biochem.*, **36(1)**, 32-38 (1973).
7. Sambrook, J. *et al.* (eds.), *Molecular Cloning: A Laboratory Handbook*, 2nd edition. Cold Spring Harbor Laboratory Press (Cold Spring Harbor, NY) p. 1.61 and p. B.16 (1989).
8. Kasche, V. *et al.*, *Prep. Biochem.*, **11(3)**, 233-250 (1981).
9. Hansen, J.N., *Prep. Biochem.*, **4(6)**, 473-488 (1974).
10. Holm, C. *et al.*, *Gene*, **42(2)**, 169-173 (1986).
11. La Claire, J.W., and Herrin, D.L., *Plant Mol. Biol. Reporter*, **15(3)**, 262-272 (1997).
12. Hilz, H. *et al.*, *Eur. J. Biochem.*, **56(1)**, 103-108 (1975).
13. Bergmeyer, H.-U. (ed.), *Methods of Enzymatic Analysis*, 3rd edition. Academic Press (New York, NY), Vol. 2, p. 299 (1983).
14. Motley, S.T. *et al.*, *BMC Genomics*, **15(1)**, 443 (2014).

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.

Standard Warranty

The applicable warranty for the products listed in this publication 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.

© 2022 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved.

SAE0151pis Rev 03/22 RBG,DT,LB,GCY,MAM

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