



Recombinant Tritirachium album Proteinase K (PROK)

Product Code	CSB-EP361972TIQ-B
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P06873
Product Type	Recombinant Protein
Immunogen Species	Parengyodontium album (Tritirachium album)
Purity	>85% (SDS-PAGE)
Sequence	AAQTN APWGLARISS TSPGTSTYYY DESAGQGSCV YVIDTGIEAS HPEFEGRAQM VKTTYSSRD GNGHGHHCAG TVGSRTYGVA KKTQLFGVKV LDDNGSGQYS TIIAGMDFVA SDKNNRNCPK GVVASLSLGG GYSSSVNSAA ARLQSSGVMV AVAAGNNNAD ARNYSPASEP SVCTVGASDR YDRRSSFSNY GSVLDIFGPG TSILSTWIGG STRSISGTSM ATPHVAGLAA YLMTLGKTTA ASACRYIADT ANKGDLNIP FGTVNLLAYN NYQA
Source	E.coli
Target Names	PROK
Protein Names	Recommended name: Proteinase K EC= 3.4.21.64 Alternative name(s): Endopeptidase K Tritirachium alkaline proteinase
Expression Region	106-384
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	Tag type will be determined during the manufacturing process.
Protein Length	Full Length of Mature Protein

Description

Proteinase K (PROK) is a highly active extracellular alkaline serine endopeptidase from Tritirachium album limber, belonging to the subtilisin family [1][2]. It is known for its ability to digest native keratin and is widely used for facilitating nucleic acid isolation by degrading contaminating proteins in cell lysates and for inactivating enzymes such as DNase and RNase without denaturation [3]. Proteinase K is a useful tool for the preparation of protein-free samples of DNA or RNA due to its properties [4]. Moreover, it is used as a research tool for investigating pathogenic mechanisms in neurodegeneration [5]. The enzyme's structure is affected by various factors, which in turn govern its catalytic proficiency, and even small structural changes can have detrimental effects on its activity [6]. Proteinase K has a substrate recognition site that includes specific residues, and its crystal structure has been determined by X-



ray diffraction studies [7][8]. Additionally, it is known that the enzyme exhibits a strong similarity to bacterial subtilisins [9].

The enzyme's properties make it a valuable tool in various fields, including molecular biology, biochemistry, and neurodegenerative disease research. Its ability to degrade proteins without denaturation makes it essential in nucleic acid isolation and enzyme inactivation. The structural characteristics and substrate recognition site of Proteinase K provide insights into its catalytic mechanism and potential applications in protein engineering. Furthermore, its similarity to bacterial subtilisins suggests evolutionary and functional relationships that could be explored further.

References:

- [1] J. Pandhare, C. Dash, M. Rao, & V. Deshpande, "Slow tight binding inhibition of proteinase k by a proteinaceous inhibitor", *Journal of Biological Chemistry*, vol. 278, no. 49, p. 48735-48744, 2003. <https://doi.org/10.1074/jbc.m308976200>
- [2] C. Betzel, S. Gourinath, P. Kumar, P. Kaur, M. Perbandt, S. Eschenburget al., "Structure of a serine protease proteinase k from tritirachium album limber at 0.98 Å resolution", *Biochemistry*, vol. 40, no. 10, p. 3080-3088, 2001. <https://doi.org/10.1021/bi002538n>
- [3] J. Arnórsdóttir, "Crystallographic studies on a cold adapted subtilase and proteins involved in mrna processing",. <https://doi.org/10.53846/goediss-538>
- [4] G. Pal, C. Kavounis, K. Jany, & D. Tsernoglou, "The three-dimensional structure of the complex of proteinase k with its naturally occurring protein inhibitor, pki3", *Febs Letters*, vol. 341, no. 2-3, p. 167-170, 1994. [https://doi.org/10.1016/0014-5793\(94\)80450-8](https://doi.org/10.1016/0014-5793(94)80450-8)
- [5] S. Abd-Elhadi, A. Honig, D. Simhi-Haham, M. Schechter, E. Linetsky, T. Ben-Huret al., "Total and proteinase k-resistant α -synuclein levels in erythrocytes, determined by their ability to bind phospholipids, associate with parkinson's disease", *Scientific Reports*, vol. 5, no. 1, 2015. <https://doi.org/10.1038/srep11120>
- [6] C. Xu, A. Battig, B. Schartel, R. Siegel, J. Senker, I. Forstet al., "Investigation of the thermal stability of proteinase k for the melt processing of poly(l-lactide)", *Biomacromolecules*, vol. 23, no. 11, p. 4841-4850, 2022. <https://doi.org/10.1021/acs.biomac.2c01008>
- [7] S. Koszelak, J. Ng, J. Day, T. Ko, a. Greenwood, & A. McPherson, "The crystallographic structure of the subtilisin protease from penicillium cyclopium,", *Biochemistry*, vol. 36, no. 22, p. 6597-6604, 1997. <https://doi.org/10.1021/bi963189t>
- [8] K. Yamashita, Y. Kikkawa, K. Kurokawa, & Y. Doi, "Enzymatic degradation of poly(l-lactide) film by proteinase k: quartz crystal microbalance and atomic force microscopy study", *Biomacromolecules*, vol. 6, no. 2, p. 850-857, 2005. <https://doi.org/10.1021/bm049395v>
- [9] G. Fa and G. Hg, "Proteinase k from tritirachium album limber", *European Journal of Biochemistry*, vol. 179, no. 1, p. 185-194, 1989. <https://doi.org/10.1111/j.1432-1033.1989.tb14539.x>

Reconstitution

We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL. We recommend to add 5-50% of glycerol (final



concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.

Shelf Life

The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself.

Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.