

Product Information

Procaspase-3

Human, Recombinant

Expressed in *E. coli*

Product Number **P1488**

Storage Temperature -70°C

Product Description

Procaspase-3 is produced by a cDNA sequence encoding amino acid residues 1-277 of human procaspase 3. It is expressed in *E. coli*. Purity of recombinant human procaspase 3 is greater than 90% by SDS-PAGE. The accession number for the sequence is U13738. Procaspase 3 can be activated by treating 10-30 ng of the proenzyme for 30 min with 0.1-0.5 units of caspase 8, where 1 unit of caspase 8 will cleave 1 nmol of substrate per hr at 37°C .

Apoptosis or programmed cell death (PCD), plays an essential role in development, homeostasis and defense of multicellular organisms. Several cell surface receptors belonging to the TNF receptor superfamily can trigger apoptosis upon binding to their respective ligands. Among the many known effectors of apoptosis the cysteine aspartic-specific proteases (caspases) play a crucial role in every cell type studied.^{1,2} The caspases comprise a family of at least 14 cysteine proteases having similar amino acid sequences, structure and substrate specificity. All caspases cleave the peptide backbone at an aspartic acid carboxyl. Caspases can be differentiated and classified into three groups based on the preferred tetrapeptide recognition sequence at the substrate cleavage site.^{3,4} Caspase-3 (CPP32, Yama, apopain) is a member of the group 2 caspases with specificity for the recognition sequence DExD.⁵

Caspase-3 exists in cells as an inactive 32 kDa prozyme, procaspase 3. Cleavage by caspase 8, caspase 9 or caspase 10 generates a 12 kDa and a 17 kDa subunit that reassemble as a heterotetramer to form the active enzyme.⁶ Active caspase 3 cleaves Bcl-2 and Bcl-X_L destroying the antiapoptotic function of these proteins. It also cleaves ICAD resulting in the release of active CAD that cleaves DNA and promotes chromatin condensation.⁶ Active Caspase 3 also cleaves full-length recombinant gelsolin in a manner

similar to the cleavage of gelsolin in apoptotic cells following Fas activation. Gelsolin fragments have been shown to regulate actin dynamics and to promote cytoplasmic and nuclear apoptosis.⁷

Reagent

Recombinant human procaspase-3 is supplied as a lyophilized protein.

Precautions and Disclaimer

For laboratory use only. Not for drug, household, or other uses. Please consult the Material Safety Data Sheet for handling recommendations before working with this material.

Preparation Instructions

Reconstitute the vial contents with phosphate buffered saline (PBS) at a suggested concentration of 0.1 $\mu\text{g}/\mu\text{L}$.

Storage/Stability

Lyophilized recombinant human procaspase is stable for 1 year at -70°C . Following reconstitution, single-use aliquots of the enzyme solution should be stored at -70°C . Avoid multiple freeze-thaw cycles.

References

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3. Thornberry, N.A., et al., J. Biol. Chem., **272**, 17907-17911 (1997).
4. Thornberry, N.A., and Lazebnik, Y., Science, **281**, 1312-1316 (1998).
5. Humke, E.W., et al., J. Biol. Chem., **273**, 15702-15707 (1998).
6. Wolf, B.B., and Green, D.R., J. Biol. Chem., **274**, 20049-20052 (1999).
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