

Active Recombinant Human Topoisomerase (DNA) I

Cat. No. TOP1-1194H Lot. No. (See product label)

SPECIFICATION

Species Human

Source Sf9 Cells

ProteinLength 1-765 aa

Description

Topoisomerase I and II are the main subtypes of topoisomerase. Human DNA Topoisomerase I is the best studied of the DNA topoisomerase family. Topoisomerase I function includes catalyzing the relaxation of both positive and negative supercoiled DNAs without the requirement of energy. In addition to DNA replication and transcriptional activation, DNA Topoisomerase I also plays a major role in pre-mRNA splicing, cell cycle, and other gene regulatory pathways during cell growth and development. In recent years, topoisomerases have become popular targets for cancer chemotherapy treatments. It is thought that topoisomerase inhibitors block the ligation step of the cell cycle, generating single and double stranded breaks that harm the integrity of the genome, such as the topotecan used to treat CMML, is a kind of *topoisomerase I inhibitor*. Tyrosine 723 was identified as an active site for the DNA binding activity of DNA Topoisomerase I. The covalent intermediate of topo I and DNA complex includes nucleophilic attack by the O4-oxygen of tyrosine 723 on a phosphoester linkage in the DNA. Mutation from tyrosine to phenylalanine at position 723 preferentially binds the supercoiled DNA rather than relaxed DNA in the mixture of supercoiled and relaxed DNAs. But mutation at Tyr723 neither affects its kinase activity that phosphorylates splicing factors of SR protein family nor its transcription activity of class II genes in vitro. The mutant Y723F of DNA Topoisomerase I protein (Y723F) was expressed in baculovirus system and purified by using an affinity column and FPLC chromatography.

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Purified Topo I (Y723F) has been tested for in vitro DNA relaxation assay. Purified mutant Topo I protein (Y723F) is greater than 95% homogeneous and contains no detectable protease, DNase, and RNase activity. Anti-topoisomerase antibodies (ATA) are autoantibodies directed against topoisomerase. Diseases with ATA are autoimmune disease because they react with self-proteins. They are also referred to as anti-DNA topoisomerase I antibody (anti-topo I)

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| Form | Liquid. Supplied in 20 mM Tris-HCl, pH 8.0, 100 mM KCl, 0.2 mM EDTA, 1 mM DTT, 20 % glycerol. |
| Purity | > 95% by SDS-PAGE. |
| Activity | 0.1-1 ng of mutated Topo I (Y723F) has been tested for relaxation activity. |
| Usage | For in vitro use only. |
| Storage | Quality guaranteed for 12 months store at -80°C. Avoid freeze / thaw cycles. |

GENE INFORMATION

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|-----------------------|--|
| Gene Name | TOP1 topoisomerase (DNA) I [Homo sapiens] |
| Synonyms | TOP1; topoisomerase (DNA) I; TOPI; DNA topoisomerase1; EC 5.99.1.2; OTTHUMP00000031713; DNA topoisomerase I; topoisomerase I; type I DNA topoisomerase |
| Gene ID | 7150 |
| mRNA Refseq | NM_003286 |
| Protein Refseq | NP_003277 |

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|----------------------------|--|
| MIM | 126420 |
| UniProt ID | P11387 |
| Chromosome Location | 20q12-q13.1 |
| Function | ATP binding; DNA topoisomerase (ATP-hydrolyzing) activity; DNA topoisomerase type I activity; chromatin binding; nucleotide binding; protein binding |

PDB rendering based on 1a31.



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