3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

ProductInformation

Monoclonal Anti-Topoisomerase I
Clone Mab1
Purified Mouse Immunoglobulin

Product Number **T 8573**

Product Description

Monoclonal Anti-Topoisomerase I (mouse IgG1 isotype) is derived from the Mab1 hybridoma produced by the fusion of SP2/0 mouse myeloma cells and splenocytes from BALB/c mice immunized with human purified topoisomerase I. The isotype is determined using Sigma ImmunoType™ Kit (Product Code ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Product Code ISO-2).

Monoclonal Anti-Topoisomerase I recognizes human topoisomerase I (approx. 100 kDa). Applications include detection of topoisomerase I by immunoblotting[1] and inhibition of topoisomerase I activity.[1]

The topology of the DNA is a crucial issue in different biological processes like recombination, replication, transcription, and chromatin remolding. DNA topoisomerases are enzymes that control the amount of supercoiling in DNA.[2, 3] Without topoisomeraes, DNA cannot replicate normally. The protein family of DNA topoisomerases is divided into two types (type I and II) based on their mechanism and physical properties. While the type I topoisomerases are monomeric and do not require ATP, the type II contain multi-subunits and depend on ATP for their activity. The type I enzymes include eukaryotic and bacterial topoisomerase I and III. The type II enzymes include bacterial DNA gyrase and topoisomerase IV and the eukaryotic topoisomerase II. Type I enzymes introduce transient single strand breaks in DNA, while type II enzymes produce transient double-strand breaks in the DNA .[2, 3]

Human DNA Topoisomerase I belongs to the subtype IB enzymes. The protein has four distinct domains. The N-terminal 214 amino acids are dispensable for relaxation activity and constitutes a hydrophilic and highly protease-sensitive region of the protein. There are four nuclear localization signals in the N-terminal domain. The second domain is a core domain of 421 amino acids that is responsible for DNA binding and contains most of the catalytic residues. A linker domain of 77 amino acids follows the core domain. The fourth domain, which is 53 amino acids long, contains the active site Tyr^{723} that is responsible for the single break in the DNA.[3] Recently it was reported that DNA topoisomerase I is involved in modulation of RNA and is present in retroviral particles (like HIV1). Furthermore, the enzyme enhances HIV-1 cDNA production in reverse transcription assays *in vitro*.[4]

Monoclonal antibodies specific for human DNA Topoisomerase I are powerful tools for studying topoisomerase I cellular functions and mode of regulation.

Reagent

Monoclonal Anti-Topoisomerase I is supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

Antibody concentration: Approx. 2 mg/ml

Precautions and Disclaimer

Due to the sodium azide content, a material safety data sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazards and safe handling practices.

Storage/Stability

For continuous use, store at 2-8 °C for up to one month. For prolonged storage, freeze in working aliquots at –20 °C. Repeated freezing and thawing is not recommended. Storage in frost-free freezers is also not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilutions should be discarded if not used within 12 hours.

Product Profile

For immunoblotting, a minimum working antibody concentration of 1-2 µg/ml is recommended using an extract of A231 human kidney cells.

Note: In order to obtain the best results using various techniques and preparations, we recommend determining optimal working dilutions by titration.

References

1. Takahashi, H., et al., Hybridoma, **19**, 331-334 (2000).
2. Froelich-Ammon, S.J., et al., J. Biol. Chem., **270**, 21429-21432 (1995).
3. Champoux, J.J., Annu. Rev. Biochem., **70**, 369-413 (2001).
4. Takahashi, H., et al., Proc. Nat. Acad. Sci. USA, **92**, 5694-5698, (1995).

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