

Extreme Thermostable Single-Stranded DNA Binding Protein

Cat. No.: E1520753 | Pack size: 100 µg | Storage: Store at -20°C

Overview

Extreme Thermostable Single-Strand DNA Binding Protein (ET SSB) is a single-strand DNA binding protein isolated from thermophilic microorganisms, with a molecular weight of 16 kDa. It retains full activity after incubation at 95°C for 60 minutes. Due to its extremely high thermostability, ET SSB can be used in applications requiring very high temperature conditions, such as nucleic acid amplification and sequencing.

ET SSB is a sequence-independent single-strand DNA binding protein; it does not bind RNA or double-stranded DNA. ssDNA is prone to degradation by DNase and the formation of secondary structures, and its instability greatly limits the normal progress of enzymatic reactions. Binding of ET SSB to ssDNA stabilizes and protects single-stranded DNA from DNase degradation or secondary structure formation, facilitates the binding of DNA polymerase to the substrate, thereby increasing the catalytic activity of DNA polymerase and improving the amplification efficiency of PCR and other reactions.

SSB proteins exist in almost all organisms. Although all SSB proteins have similar functions, they share little sequence similarity and differ significantly in their ssDNA binding properties. Based on their oligomeric state, SSB proteins can be classified into four types: monomers, homodimers, heterotrimers, and homotetramers. ET SSB originates from hyperthermophilic microorganisms and exists mainly as a monomer in solution, with each monomer encoding one OB-fold domain. It forms dimers or multimers only when binding to single-stranded DNA substrates.

Applications

- Increase the processivity of DNA polymerase;
- Stabilize and label ssDNA structures;
- Improve the yield and specificity of PCR and isothermal amplification reactions;
- Enhance the yield and conversion efficiency of reverse transcriptase (RT) during RT-PCR;
- Improve DNA sequencing in regions with strong secondary structures;
- Enhance the activity of RecA in ssDNA binding and strand transfer.

Usage Method

- ET SSB is active in any polymerase buffer;
- Add 50-200 ng of ET SSB per 50 µL reaction system.

Quality Control

Protein Purity Assay

SDS-PAGE analysis shows protein purity $\geq 95\%$.

Endonuclease Activity Assay

After incubating 0.5 μg ET SSB with 200 ng of supercoiled plasmid DNA at 37°C for 4 hours, agarose gel electrophoresis detects that less than 10% of the plasmid DNA is converted to nicked or linear forms.

Non-Specific Nuclease Activity Assay

After incubating 0.5 μg ET SSB with 15 ng of double-stranded DNA fragments at 37°C for 16 hours, agarose gel electrophoresis shows no change in the double-stranded DNA substrate.

Host DNA Residue Detection

Using E. coli 16S rDNA-specific primer/probe sets and real-time PCR, the residual E. coli host genomic DNA in 0.5 μg ET SSB is less than 10 copies.

Precautions

- This product is for professional scientific research use only. It must not be used for clinical diagnosis or treatment, nor for food or drug purposes, nor stored in ordinary residential areas.
- For your safety and health, wear a lab coat and disposable gloves during handling.

Specifications

Attribute	Value
Synonyms	ET SSB Thermostable SSB
Molecular Weight	16 kDa
Specifications & Purity	BioReagent, DNase, RNase free, PCR Reagent, $\geq 95\%$ (SDS-PAGE), 500 $\mu\text{g}/\text{mL}$
Stability And Storage	Store at -20°C long term (24 months).
Storage Conditions	Store at -20°C
Shipped In	Ice chest + Ice pads. This product requires cold chain shipping. Ground and other economy services are not available.
Grade	BioReagent, DNase, RNase free, PCR Reagent
Purity	$\geq 95\%$ (SDS-PAGE)

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Limitations & Disclaimer

For Research Use Only (RUO). Not for use in human or animal diagnostics, therapeutics, or in vivo applications. Not for food, cosmetic, or household use.

This product is not a CE-marked in vitro diagnostic device under IVDR (EU) 2017/746 and is not an FDA-cleared device under 21 CFR. Use is restricted to verified businesses, institutions, and qualified professionals.

Where any kit component is classified as hazardous under CLP (EC) 1272/2008 or OSHA HCS (29 CFR 1910.1200), the product Safety Data Sheet (SDS) takes precedence over this document for handling, storage, transportation, disposal, and emergency procedures.

Performance depends on sample type, sample condition, handling, and operator technique. Users are responsible for validating the product for their specific application.

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