studies indicate that in the presence of ATP, RecA derepresses more than 20 genes (1).

Source: RecA is expressed as a N-terminal 6X His tagged recombinant protein from a plasmid in *E. coli* strain ER3010 which encodes a full-length 353 amino acids wild type *E. coli* RecA protein.

Supplied in: 0.1 mM EDTA, 10 mM Tris-HCl (pH 7.5 @ 25°C), 1 mM DTT and 50% glycerol.

Applications:
- Visualization of DNA structures with electron microscopy (3)
- D-loop mutagenesis (4)
- Screening libraries using RecA-coated probes (5,6)
- Cleavage of DNA at any single predetermined site (7,8,9)
- RecA mediated affinity capture for full length cDNA cloning (10,11)

DNA fragments with homologous duplex DNA. The reaction has three distinct steps: (i) RecA polymerizes on the single-strand DNA, (ii) the nucleoprotein filament binds the duplex DNA and searches for a homologous region, (iii) the strands are exchanged (2).

Reagents Supplied with Enzyme:
10X RecA Reaction Buffer.

Note: ATPγS which is required for triple helix formation is not supplied.

Reaction Conditions:
1X RecA Reaction Buffer. Incubate at 37°C.

1X RecA Reaction Buffer:
70 mM Tris-HCl
10 mM MgCl₂
5 mM dithiothreitol
pH 7.5 @ 25°C

Molecular Weight: 38,907 daltons.

Heat Inactivation: 65°C for 20 minutes.

Quality Assurance: Each lot is tested for its ability to form a stable triple helix and is visually determined to be >99% pure on an SDS-polyacrylamide gel.

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**Quality Control Assays**

**Exonuclease Activity:** A 50 µl reaction in RecA Reaction Buffer containing 1 µg of the mixture of single and double-stranded [32P] *E. coli* DNA and 10 µg of RecA incubated for 4 hours at 37°C releases < 0.1% of the total radioactivity.

**Endonuclease Activity:** A 50 µl reaction in RecA Reaction Buffer containing 1 µg of supercoiled φX174 RF I DNA and 10 µg of RecA incubated for 4 hours at 37°C results in < 10% conversion to the nicked form as determined by agarose gel electrophoresis.

**Non-specific Nuclease Assay:** A 50 µl reaction in RecA Reaction Buffer containing 40 ng of labeled RNA and 10 µg of RecA is incubated at 37°C. After incubation for 16 hours, > 90% of the substrate RNA remains intact as determined by agarose gel electrophoresis.

**RNase Assay:** A 50 µl reaction in RecA Reaction Buffer containing 40 ng of labeled RNA and 10 µg of RecA is incubated at 37°C. After incubation for 16 hours, > 90% of the substrate RNA remains intact as determined by agarose gel electrophoresis.
Molecular Weight Determination (Mass Spectrometry): The molecular weight of RecA is between 38,897 and 38,917 as determined by mass spectrometry analysis.

Protein Concentration Determination:
The concentration of RecA is between 1.9 and 2.1 mg/ml as determined by UV absorption at 280 nm by the Pace method using the extinction coefficient of 21,555 and molecular weight of 38,907 daltons (12).

RecA Functional Assay: The plasmid pUC19 contains 5 HpyCH4IV sites. A 60 mer was designed with complementarity to the region centered around the HpyCH4IV site at position 374. A reaction containing 1 µg pUC19, 0.18 µg 60 mer, 0.3 mM ATP γ-S, 4 µg RecA, in 40 µl 1X RecA Reaction Buffer was incubated at 37°C for 10 minutes to form a stable triple helix. The unprotected sites were methylated using 8 units of SssI supplemented with 160 µM SAM for 10 minutes at 37°C. The reaction was stopped and the triple helix was disrupted by incubation at 65°C for 15 minutes. The reaction was cooled and 10 units of HpyCH4IV were added followed by digestion at 37°C for 20 minutes. > 95% of the product is single cut pUC19.

References:

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References: