

Endonuclease III (Nth)



1-800-632-7799
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M0268S 003130115011

M0268S



1,000 units 10,000 U/ml Lot: 0031301

RECOMBINANT Store at -20°C Exp: 1/15

Description: Endonuclease III (Nth) protein from *E. coli* acts both as N-glycosylase and an AP-lyase. The N-glycosylase activity releases damaged pyrimidines from double-stranded DNA, generating a basic (AP site). The AP-lyase activity of the enzyme cleaves 3' to the AP site leaving a 5' phosphate and a 3'-phospho- α , β -unsaturated aldehyde.

Some of the damaged bases recognized and removed by Endonuclease III include urea, 5, 6 dihydroxythymine, thymine glycol, 5-hydroxy-5 methylhydantoin, uracil glycol, 6-hydroxy-5, 6-dihydrothimine and methyltartronylurea (1,2).

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Source: An *E. coli* strain which carries the cloned *nth* gene

Applications:

- Single cell gel electrophoresis (Comet assay) (3,4,5)
- Alkaline elution (6)
- Alkaline unwinding (7)

Supplied in: 250 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 μ g/ml BSA and 50% glycerol.

Reagents Supplied with Enzyme:

10X Endonuclease III (Nth) Reaction Buffer.

Reaction Conditions: 1X Endonuclease III (Nth) Reaction Buffer. Incubate at 37°C.

1X Endonuclease III (Nth) Reaction Buffer:

20 mM Tris-HCl
1 mM EDTA
1 mM dithiothreitol
pH 8.0 @ 25°C

Unit Definition: One unit is defined as the amount of enzyme required to cleave 1 pmol of a 34 mer oligonucleotide duplex containing a single AP site* in a total reaction volume of 10 μ l in 1 hour at 37°C.

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*An AP site is created by treating 10 pmol of a 34 mer oligonucleotide duplex containing a single uracil residue with 1 unit of Uracil-DNA Glycosylase (UDG) for 2 minutes at 37°C.

Assay Conditions:

1X Endonuclease III (Nth) Reaction Buffer containing 10 pmol of fluorescently labeled oligonucleotide duplex in a total reaction volume of 10 μ l.

Recommended Dilution for the Comet Assay:

1:10⁴ to 1:10⁵ (3,4,5). A detailed protocol can be found at www.neb.com

Quality Control Assays

16-Hour Incubation: A 50 μ l reaction containing 1 μ g of λ DNA (HindIII digest) and 25 units of Endonuclease III in NEBuffer 1 incubated for 16 hours at 37°C resulted in a DNA pattern free of detectable nuclease degradation as determined by agarose gel electrophoresis.

Exonuclease Activity: Incubation of a 50 μ l reaction containing 10 units of Endonuclease III in NEBuffer 1 with 1 μ g of a mixture of single and double-stranded [³H] *E. coli* DNA (10⁵ cpm/ μ g) for 4 hours at 37°C released < 0.1% of the total radioactivity.

*An AP site is created by treating 10 pmol of a 34 mer oligonucleotide duplex containing a single uracil residue with 1 unit of Uracil-DNA Glycosylase (UDG) for 2 minutes at 37°C.

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Endonuclease Activity: Incubation of a 50 μ l reaction containing 10 units of Endonuclease III in NEBuffer 1 with 1 μ g ϕ X174 RF I DNA for 4 hours at 37°C resulted in < 10% conversion to RFI as determined by agarose gel electrophoresis.

Heat Inactivation: 65°C for 20 minutes.

References:

1. Dizdaroglu, M. Laval, J. and Boiteux, S. (1993) *Biochemistry* 32, 12105-12111.
2. Hatahet, Z. et al. (1994) *J. Biol. Chem.* 269, 18814-18820.
3. Singh, N. et al. (1988) *Experimental Cell Research* 175, 184-191.
4. Collins, A. et al. (1993) *Carcinogenesis* 14, 1733-1735.
5. Collins, A. et al. (1996) *Environmental Health Perspectives* 104, 465-469.
6. Pflaum, M. et al. (1998) *Free Rad. Res.* 29, 585-594.
7. Hartwig, A. et al. (1996) *Toxicology Letters* 88, 85-90.
8. Marks, K., New England Biolabs, Inc., unpublished observations.

CERTIFICATE OF ANALYSIS

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