DNase I (GMP-grade)

Introductions

DNase I is a deoxyribonucleic acid endonuclease that hydrolyzes single- or double-stranded DNA, producing dinucleotide, trinucleotide, and oligonucleotide products with 3'-hydroxyl and 5'-phosphate group ends. The activity of DNase I is Ca^{2+} dependent and can be activated by either Mg^{2+} or Mn^{2+}. In the presence of Mg^{2+}, DNase I can randomly cleave any site of double-stranded DNA. In the presence of Mn^{2+}, DNase I recognizes both strands of DNA simultaneously and cleaves them at nearly identical sites.

DNase I can act on single-stranded DNA, double-stranded DNA, chromatin, and RNA:DNA hybrids. It is suitable for RNA extraction, in vitro transcription, and DNA removal in RT-PCR experiments. The production process of this product strictly controls host protein residues, nucleic acid residues, etc., and conforms to GMP production and quality management standards.

Composition and storage conditions

Components \ Size	50 KU	500 KU	2500 KU	Storage
DNase I (50 KU/mL)	1 mL	10 mL	50 mL	-70°C or below
Shipping: Dry Ice		**Shelf life:** 2 years		

Quality Control

Parameter	Standard
Appearance	Clear and transparent solution
pH	7.0-8.0
Purity	≥ 95%
Activity	40-60 KU/mL
RNase Residues	50 U enzyme incubated with substrate at 37°C for 4 hours, substrate degradation < 10%
Bacterial Endotoxins	≤100 EU/mL
Host DNA Residues	≤1 ng/μL

Protocol

Take the removal of DNA template in in vitro transcription for example

1. Add 2–4 U of DNase I per 1 μg of template DNA after the transcription reaction, and the amount of enzyme can be optimized according to the actual situation.

2. Mix thoroughly. Incubate for 10 min at 37°C.

3. A final concentration of 5 mM EDTA was added, mixed well, and heated at 65°C for 10 min to stop the reaction. RNA is easily degraded when heated, DNase I can be removed with phenol/chloroform extraction, and RNA can be precipitated with ethanol.

Product description

1. **Enzyme activation unit (U) definition:** 1 U is defined as the amount of enzyme required to completely degrade 1 μg of pBR322 DNA in a 100 μL reaction system at 37°C in 10 min. Complete decomposition refers to the degradation of most DNA fragments into tetranucleotides or shorter nucleotides.

2. **Stored solution composition:** 10 mM Tris-HCl (pH 7.6 at 25°C)，2 mM $CaCl_2$，50% Glycerol。

Note

EDTA should be added to a final concentration of 5 mM to protect RNA from being degraded during enzyme inactivation.

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