YTA-Deoxyribonuclease I (DNase I) Lyophilized powder

Components	Cat:YT9058	Cat:YT9069
DNase I (Lyophilized powder)	10 mg	1 gr

For research use only

Activity: ≥400 kunitz u/mg protein
Protein: ≥85%
Source: Bovine pancreas
Storage : at -20°C

Description

Deoxyribonuclease I (DNase I) is an endonuclease that cleaves DNA at phosphodiester bonds near pyrimidines, producing fragments with 5′-phosphates. It generates tetranucleotides on average. With Mg^{2+}, it cleaves DNA strands randomly and independently; with Mn^{2+}, both strands are cut at similar sites. DNase I digests single- and double-stranded DNA, as well as chromatin (though histones slow the process).

Found in most tissues, DNase I is abundant in the pancreas, where it was first isolated. Its molecular mass is ~30,072 Da, and it exists as glycoproteins with two disulfide bridges. Bovine pancreatic DNase I includes four forms (A–D), with A being most common. Forms differ in carbohydrate composition and amino acid content.

Carbohydrate Content

Carbohydrate / Form	A	B	C
N-Acetylglucosamine	2	3	2
Mannose	6	5	5
Sialic Acid	-	1	-
Galactose	-	1	-

Form C also differs by one fewer His and one more Pro. DNase I is commonly used to remove DNA from samples or prepare DNA for labeling, and is widely cited in research protocols.

Isoelectric points:

- A: 5.22
- B: 4.96
- C: 5.06
- D: 4.78

Optimal pH: 7-8
Extinction Coefficient: E280 1% = 11.1

Activators

- DNase I has an absolute requirement for divalent metal cations.
- The most commonly used divalent metal cation is Mg2+.
- However, Mn2+, Ca2+, Co2+, and Zn2+ will activate DNase I.
- 5 mM Ca+2 will stabilize DNase I against proteolytic digestion.
- 0.1 mM Ca+2 is needed to reduce the rate of inactivation by one-half.

Inhibitors

There is no general inhibitor specific for DNase I.

Citrate inhibits Mg2+-activated DNase I, but not Mn2+-activated DNase I.

• 2-Mercaptoethanol (the reduced enzyme is inactive, but can be reactivated in the presence of Ca2+ or Mg2+ ions)

• Chelators (such as EDTA, EGTA)

• Sodium dodecyl sulfate (SDS); and actin

Precautions and Disclaimer

For R&D use only. Not for drug, household,or other uses. Please consult the Safety DataSheet for information regarding hazards and safe handling practices.

Product

This product is purified from bovine pancreas. The purification procedure is not selective for any form (A, B, C, or D) of DNase I. It is supplied as a lyophilized powder, containing CaCl2. Specific activity: ≥ 400 Kunitz units/mg protein Unit Definition

Unit Definition:

• One Kunitz unit will produce a ΔA260 of 0.001 per minute per mL at pH 5.0 at 25 °C, using DNA,Type I or III, as substrate, with [Mg2+] = 4.2 mM.

• This enzyme assay reaction is performed in 95 mM acetate buffer, pH 5.0, at 25 °C, containing 4.75 mM Mg2+ and 1.9 mM Ca2+, in a 3 mL reaction.

Storage/Stability

DNase I has a recommended retest date of four years, when unopened and stored long-term at the recommended temperature, –20 °C.

Preparation Instructions

DNase I is soluble in 0.15 M NaCl at 5 mg/mL. Solutions of DNase I at 10 mg/mL in 0.15 M NaCl may lose <10% of its activity when stored for a week in aliquots at –20 °C. The same solutions stored in aliquots at 2-8 °C can lose ~20% activity.

Alternatively, solutions at a minimum concentration of 1 mg protein/mL, with 5 mM CaCl2 and stored at –20 °C, may retain >90% activity for at least a year. Solutions containing For applications unaffected by glycerol, two other storage buffers are options, as these formulations do not freeze at –20 °C:

• 20 mM sodium acetate (pH 6.5), containing 5 mM CaCl2 and 0.1 mM phenylmethylsulfonyl fluoride (PMSF), 50% (v/v) glycerol, with DNase I at ≤5 mg/mL

• 10 mM Tris-HCl (pH 7.5), 50 mM NaCl, 10 mM MgCl2, 1 mM DTT, 50% (v/v) glycerol, with DNase I at ≤2 mg/mL