Technical Data Sheet

DNase I

for molecular biology

Order number: 1121

DNase I (Deoxyribonuclease I) cleaves single-stranded and double-stranded DNA (including chromatin) at neutral pH (optimum is a pH of 7.8), producing polynucleotides with a 5'-phosphate and a free hydroxyl-group in 3' position. The activity and specificity (single-strand versus double-strand) of DNase I is determined by the surrounding ions[1]. Maximum activation requires the presence of Mg^{2+} and Ca^{2+} ions. Magnesium ions mainly yield in the generation of single-strand nicks, while the presence of Mn^{2+} ions cause double-strand breaks. DNase I is inhibited by chelators such as citrate, EDTA and SDS or β-mercaptoethanol.

Product details

DNase I is extracted from bovine pancreas and purified using multiple precipitation, fractionation, chromatography, and filtration steps. Due to the highly optimized purification processes, a product of highest quality, stability and batch-to-batch consistency is provided. DNase I is delivered as a salt-free, freeze-dried powder. Store at - 20°C.

Activity (Kunitz): > 1000 U /mg

Unit Definition: The amount of enzyme causing an increase in extinction at 260 nm of 0.001 per minute at 25°C and pH 5.0.

Application

DNase I is used to digest DNA in the isolation and purification of RNA.

Dissolve DNase at 2 mg/ml in 0.15 M sodium chloride or reaction buffer (e. g. 50 mM Tris·HCl pH 7.5; 50 µg/ml BSA; 10 mM $MgCl_2$ or 10 mM $MnCl_2$).

Heat-inactivation of DNase I: Heat to 99°C for 10 minutes.

Preparation of RNase-free DNase I (according to ref. 2, page 3.12.6 Supplement 8):

Since DNase I may contain trace amounts of RNases, it is recommended that DNase I is treated with the following protocol prior to use.

Dissolve 1 mg/ml DNase I in 0.1 M iodoacetic acid plus 0.15 M sodium acetate at a final pH of 5.3. Heat to 55°C for 40 minutes, then cool down the solution. Add 1 M $CaCl_2$ to a final concentration of 5 mM. Store in small aliquots at -20°C.

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[1] Campbell, V.W. & Jackson, D.A. (1980) J. Biol. Chem. 255, 3726-3735

[2] Ausubel, F.A., Brent, R., Kingston, R.E., Moore, D.D., Seidman, J.G., Smith, J.A. & Struhl, K. (eds.) 2001. Currrent Protocols in Molecular Biology. John Wiley & Sons, N.Y.

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