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Product Information

Ribonuclease A Solution from bovine pancreas
Solution of 50% glycerol, for molecular biology

Catalog Number **R4642**
Storage Temperature –20 °C

CAS RN 9001-99-4
EC 3.1.27.5
Synonyms: Ribonuclease I, Pancreatic ribonuclease, Ribonuclease 3′-pyrimidinooligonucleotidohydrolase, RNase A, Endoribonuclease I

Product Description
Ribonuclease A (RNase A) is an endoribonuclease that attacks at the 3′ phosphate of a pyrimidine nucleotide. The sequence of pG-pG-pC-pA-pG will be cleaved to give pG-pG-pCp and A-pG. The highest activity is exhibited with single-stranded RNA.[1]

RNase A is a single chain polypeptide containing 4 disulfide bridges. In contrast to RNase B, RNase A is not a glycoprotein.[2] RNase A can be inhibited by alkylation of His^{12} or His^{119}, which are present in the active site of the enzyme.[3] Activators of RNase A include potassium and sodium salts.

Molecular mass:[4] 13.7 kDa (amino acid sequence)

Extinction coefficient:[5] $E^{1\%}$ = 7.1 (280 nm)

Isoelectric point:[6] pI = 9.6

Optimal temperature: 60 °C (activity range of 15-70 °C)

Optimal pH:[7] 7.6 (activity range of 6-10)

Inhibitors: ribonuclease inhibitor

The product is supplied in a solution containing 50% glycerol and 10 mM Trizma®-HCl, pH 8.0.

Activity: ≥70 Kunitz[8] units/mg protein

A major application for RNase A is the removal of RNA from preparations of plasmid DNA. In this application, the presence of DNase activity as an impurity is a concern. The boiling-water bath method[9] used to eliminate contaminating DNase activity has proven unreliable. For this reason, Sigma-Aldrich developed a proprietary chromatographic preparation method for elimination of DNase activity.

This product has been specifically used in studies of nuclear envelope isolation,[10] echinoderm embryos,[11] and molecular cytogenics.[12]

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

Note: RNase A is stable to both heat and detergents. In addition, it adsorbs strongly to glass. Scrupulous precautions are necessary to ensure that residual RNase A does not cause artifacts in processes that require intact RNA.

Preparation Instructions
Note: Boiling stock solutions of Catalog No. R4642 to inactivate residual DNase is not necessary, and may cause precipitation of RNase and possible loss of enzymatic activity. If an RNase A solution is heated at a neutral pH, precipitation will occur. When heated at a lower pH, some precipitation may occur because of protein impurities that are present.

Storage/Stability
This product remains active for at least 2 years when stored properly at –20 °C.

RNase A is a very stable enzyme and solutions have been reported to withstand temperatures up to 100 °C. At 100 °C, an RNase A solution is most stable between pH 2.0 and 4.5.[13]

Procedure
For removal of RNA from preparations of plasmid DNA, DNase-free RNase A is used at a final concentration of 10 μg/ml.[14]

References

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