

Product Information

Ribonuclease A from bovine pancreas

Sigma Type II-A, ≥60% (SDS-PAGE), ≥60 Kunitz units/mg protein

R5000

Product Description

CAS Registry Number: 9001-99-4

Enzyme Commission (EC) Number: 3.1.27.5

Synonyms: RNase A, Pancreatic ribonuclease, Ribonuclease 3'-pyrimidinooligonucleotidohydrolase, Ribonuclease I, Endoribonuclease I

Molecular mass:¹ 13.7 kDa (based on amino acid sequence)

Extinction coefficient:² $E^{1\%} = 7.1$ (280 nm)

Isoelectric point:³ pI = 9.6

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

Optimal pH:⁴ 7.6 (activity range of 6-10)

Inhibitors: ribonuclease inhibitor

RNase A is an endoribonuclease that attacks at the 3'-phosphate of a pyrimidine nucleotide. For example, RNase A will cleave pG-pG-pC-pA-pG to give pG-pG-pCp and A-pG. The highest activity is exhibited with single-stranded RNA.⁵

RNase A is a single chain polypeptide with 4 disulfide bridges. In contrast to RNase B, RNase A is not a glycoprotein.⁶ RNase A can be inhibited by alkylation of His¹² or His¹¹⁹ (present in the active site of the enzyme).⁷ Activators of RNase A include potassium and sodium salts.

Several theses⁸⁻¹⁰ and dissertations¹¹⁻¹⁷ have cited use of product R5000 in their protocols.

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.

Solubility

RNase A is soluble in water at 2.5 mg/mL.

Preparation Instructions

Solutions prepared from RNase A lyophilized powder can be made free of DNase by boiling. One procedure is as follows, according to one literature method:¹⁸

1. Prepare a 10 mg/mL stock solution in 10 mM sodium acetate buffer, pH 5.2.
2. Heat to 100 °C for 15 minutes. Allow to cool to room temperature.
3. Adjust to pH 7.4 using 0.1 volume of 1 M Trizma®-HCl, pH 7.4.
4. Aliquot and store at -20 °C.

If RNase A is boiled at a neutral pH, precipitation will occur. When boiled at a lower pH, some precipitation may occur because of protein impurities that are present.

Storage/Stability

This product is supplied as a lyophilized powder. Store RNase A at -20 °C.

RNase A is a very stable enzyme. Stock solutions stored in frozen aliquots remain active for at least 6 months. RNase A solutions have been reported to withstand temperatures up to 100 °C. At 100 °C, an RNase A solution is most stable between pH 2.0-4.5.¹⁹

Usage

A major application for RNase A is the removal of RNA from preparations of plasmid DNA. For this application, DNase-free RNase A is used at a final concentration of 10 µg/mL.²⁰

References

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