Active Recombinant RNase A, Animal-Free

Cat. No. RNase A-26B **Lot. No.** (See product label)

SPECIFICATION

Product Overview	From Yeast with cloned gene encoding genetically engineered Bovine pancreatic ribonuclease
Species	Bovine
Source	Yeast
Description	RNase A is an endoribonuclease that specifically cleaves the single strand RNA at the phosphodiester bond between the 5'-ribose of a nucleotide and the 3' OH phosphate group of an adjacent pyrimidine nucleotide. The highest activity is demonstrated with single stranded RNA.
Form	The product is available as lyophilized powder and solution in 10 mM Tris-HCl, 20mM MgCl2, 50% glycerol, pH 8.0
Bio-activity	≥ 40 Kunitz units/mg
Molecular Mass	14.3 kDa
Purity	≥ 90% (SDS-PAGE)
Applications	RNase A is a versatile enzyme used in various applications across molecular biology, biochemistry, and biotechnology. RNA Removal in DNA Purification & Plasmid Isolation: RNase A selectively degrades RNA, leaving the DNA intact and ensuring the purity of the DNA sample for downstream applications. RNA Sequencing and

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA

	Analysis: Ribonuclease Protection Assays (RPA): The enzyme digests any unprotected RNA, allowing for precise quantification of target RNA. RNA Mapping: It can be employed to map the structure of RNA by selectively degrading single-stranded regions, helping in the study of RNA secondary structures. Protein and Enzyme Preparation: In the preparation of certain proteins or enzymes from biological samples, RNase A is used to remove RNA contaminants that could interfere with protein or enzyme activity assays. RNA Cleanup in Cell and Tissue Culture: RNase A is used in cell and tissue culture to degrade extracellular RNA that could interfere with experimental outcomes or contaminate samples during cell lysis. RNA Degradation in Diagnostic Tests: In some diagnostic assays, particularly those involving nucleic acid detection, RNase A is used to remove RNA to prevent false-positive results caused by RNA contamination. Selective RNA Degradation in In Situ Hybridization: In situ hybridization techniques use RNase A to selectively degrade RNA in tissue sections or cells, allowing for the specific detection of DNA sequences without interference from RNA. RNA Gel Electrophoresis: RNase A is used to degrade unwanted RNA in samples before running gel electrophoresis, ensuring clear separation and analysis of the desired nucleic acids. RNA Footprinting in Study of RNA Structure and Function: RNase A can be used in RNA footprinting experiments to study the interaction of RNA with proteins or other molecules by selectively cleaving accessible regions of RNA. Environmental and Industrial Applications: RNase A can be used in certain bioremediation processes where the degradation of RNA is necessary, such as in the treatment of RNA-containing waste in industrial settings.
Storage	At -20 centigrade for lyophilized powder. Recommends storage at -20 centigrade for solution and lyophilized powder to maintain stable for at least 3 years. RNase A is a very stable enzyme and solutions have been reported to withstand temperatures up to 100 centigrade. At 100 centigrade, an RNase A solution is most stable between pH 2.0 and 4.5.
Concentration	Recommended concentration of RNase A is 1 to 100 µg/mL depending on the

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA

	application. For removal of RNA from plasmid preparations use 10 µg/mL working solution and incubate sample for 1 hour at room temperature. For preparation of "blunt ends" of double-stranded cDNA use 100 ng/mL working solution.
CAS No.	9001-99-4
Unit Definition	One unit of the enzyme causes an increase of absorbance by 1.0 unit at 260 nm when yeast RNA is hydrolyzed at 37 centigrade and pH 5.0. Fifty units are approximately equivalent to 1 Kunitz unit.
EC No.	3.1.27.5
pH range	6-10, Optimal pH 7.6
Bioburden	Microorganisms count: < 5 cfu/g
Advantages	Advantages of Recombinant RNase A The recombinant enzyme is identical to the native RNase A in amino acid sequence, molecule structure and specifications. However, the recombinant preparation has advantages: Contaminant-Free: Recombinant RNase A is produced in a controlled environment, significantly reducing the risk of contamination with other nucleases or proteases. Lot-to-Lot Consistency: Recombinant production ensures consistent enzyme activity and quality across different batches, providing reliable performance in experimental and industrial applications. No Endogenous Nuclease Contamination: Since recombinant RNase A is expressed in a controlled system, it is free from DNA contamination, making it ideal for applications such as RNA preparation and analysis, where the presence of DNA could compromise results. Efficient RNA Digestion: Recombinant RNase A retains high specific activity, efficiently degrading RNA without affecting DNA, which is particularly important in DNA purification protocols. Cost-Effectiveness: Recombinant techniques allow for large-scale production, which can reduce costs and make the

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA

	enzyme more accessible for various applications. Animal-Free Production: Recombinant RNase A is produced without the use of animal-derived materials, making it suitable for laboratories and industries that prioritize ethical sourcing of materials.
Dilution Buffer	10 mM Tris-HCl, 20mM MgCl2, pH 8.0
Storage Buffer	10 mM Tris-HCl, 20mM MgCl2, 50% glycerol, pH 8.0
Temperature profile	Maximum activity at 60 centigrade Exhibit activity in the temperature range of 15-70 centigrade.
Activators	20mM MgCl2 The enzyme is active under a wide range of reaction conditions. At low salt concentrations (0 to 100 mM NaCl), RNase A cleaves single-stranded and double-stranded RNA as well the RNA strand in RNA-DNA hybrids. However, at NaCl concentrations of 0.3 M or higher, RNase A specifically cleaves single-stranded RNA. RNase A demonstrates peak performance when operating in the presence of 20mM MgCl2.
Inhibitors	By alkylation of His 12 and His 119 The RNase A has a high affinity to glass surfaces. At neutral pH and high concentrations (>10 mg/mL) the enzyme will precipitate. The enzyme is inhibited by diethyl pyrocarbonate (DEPC), guanidinium salts (4 M GuSCN), β-mercaptoethanol, heavy metals and RNase-inhibitors like RIBOPROTECT (RT33). In order to remove the enzyme from a sample, perform a separation with spin columns or several phenol/chloroform extractions.
Extinction Coefficient	E1% = 7.1 (280 nm)

GENE INFORMATION

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA

Official Symbol	RNase A
Synonyms	Ribonuclease A; Pancreatic Ribonuclease; Ribonuclease I; Ribonuclease 3'-pyrimidinooligonucleotidohydrolase

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA