



Worthington Ribonucleases A & B are prepared from bovine pancreas and are offered in several grades to suit various applications. When Ribonuclease A is used to remove RNA during DNA isolation, the enzyme must be free of deoxyribonuclease activity to prevent damage to the DNA. Where other enzymes are used or where the goal is recovery of intact proteins, proteolysis must be prevented. These requirements are satisfied by our Molecular Biology Grade Ribonuclease (Code: RPDF). This and other ribonuclease preparations made by Worthington are described below.

PRODUCT HIGHLIGHTS

Description	Activity	Code	Cat. No.	Size	Price
<b>RNase A, DNase and Protease Free</b> Molecular Biology Grade. Supplied as a solution containing approximately 5mg/ml in 50% glycerol. Prepared specifically for use in purifying DNA plasmids. Each lot is assayed to be free of DNase and protease. Store at 2 - 8°C. Storage at -20°C is acceptable.	≥ 2,000 units per mg protein	<b>RPDF</b>	LS002131	1 mg	\$ 23.00
			LS002132	5 mg	72.00
			LS002130	Bulk	Inquire
<b>Ribonuclease A, Purified</b> A highly purified, lyophilized preparation which may contain aggregates as a result of lyophilization but which exhibits same specific activity as RASE (below). Store at 2 - 8°C. PROTECT FROM MOISTURE.	≥ 3,000 units per mg dry weight	<b>RAF</b>	LS005649	25 mg	\$ 57.00
			LS005650	100 mg	175.00
			LS005655	Bulk	Inquire
<b>Ribonuclease A, Purified Solution</b> Monomeric form, purified by method used for RAF (above) and further processed to remove aggregates. Available as a solution in 0.1 M phosphate buffer, pH 7.4 containing 0.1% v/v phenol as a preservative. Store at -20°C. REQUIRES SPECIAL SHIPPING. DRY ICE.	≥ 3,000 units per mg protein	<b>RASE</b>	LS005677	25 mg	\$ 48.00
			LS005679	100 mg	116.00
			LS005681	Bulk	Inquire
<b>Ribonuclease A</b> Chromatographically purified. Lyophilized. Store at 2 - 8°C. PROTECT FROM MOISTURE.	≥ 2,500 units per mg dry weight	<b>R</b>	LS003431	200 mg	\$ 75.00
			LS003433	1 gm	295.00
			LS003435	Bulk	Inquire
<b>Ribonuclease B</b> A partially purified preparation containing a mixture of RNase A and RNase B. A soluble, dialyzed lyophilized powder. Store at 2 - 8°C.	≥ 1,000 units per mg dry weight	<b>RB</b>	LS005710	100 mg	\$ 95.00
			LS005715	Bulk	Inquire
<b>Ribonuclease, Filtered</b> Product Code: R, 0.22u filtered and lyophilized in vials to contain ≥ 100 mg. Store at 2 - 8°C. PROTECT FROM MOISTURE.	≥ 2,500 units per mg dry weight	<b>RS</b>	LS003438	1 vi	\$ 67.00
			LS003440	5 vi	260.00
			LS003441	Bulk	Inquire

### Related Products

Albumin, Nuclease-Free • Deoxyribonuclease I • Deoxyribonucleic Acid and Related Products • Histones • Lysozyme  
 Nuclease, Micrococcal • Nuclease, S1 • Phosphatase, Alkaline • Phosphodiesterase I • Phosphodiesterase II  
 Proteinase K • Reverse Transcriptase, Recombinant HIV • Ribonucleic Acid

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# Ribonuclease T1 and Ribonuclease T2, Animal Free



Description	Activity	Code	Cat. No.	Size	Price
<b>Ribonuclease T1, Chromatographically Purified</b> <i>Aspergillus oryzae</i> Highly purified, microbial (non-mamalian). RNase prepared with non-animal components. Supplied as a solution in 2.8M ammonium sulfate. Supplied as a dialyzed, lyophilized powder. Store at 2 - 8°C. REQUIRES SPECIAL SHIPPING. ICE PACK.	≥ 300,000 units per mg protein	<b>RT1S</b>	LS01485	100 ku	\$ 40.00
			LS01487	500 ku	126.00
			LS01488	Bulk	Inquire
<b>Ribonuclease T1, Chromatographically Purified, Lyophilized</b> Highly purified, microbial (non-mamalian). RNase prepared with non-animal components. Supplied as a dialyzed, lyophilized powder. Store at 2 - 8°C.	≥ 300,000 units per mg protein	<b>RT1L</b>	LS01490	500 ku	\$ 151.00
			LS01492	2500 ku	582.00
			LS01494	Bulk	Inquire
<b>Ribonuclease T2, Recombinant <i>Aspergillus oryzae</i>, Produced in <i>Pichia pastoris</i>, Deoxyribonuclease and Protease Free, Lyophilized Powder</b> Highly purified recombinant microbial (non-mammalian) RNase prepared with non-animal components. Free of DNase and protease. Supplied as a lyophilized powder. Store at 2 - 8°C.	≥ 10,000 units per mg protein	<b>RT2R</b>	LS01501	50 ku	\$ 75.00
			LS01502	250 ku	300.00
			LS01505	Bulk	Inquire

Pancreatic RNase A catalyzes cleavage of the phosphodiester bond between the 5'-ribose of a nucleotide and the phosphate group attached to the 3'-ribose of an adjacent pyrimidine nucleotide forming a 2', 3'-cyclic phosphate which may then be hydrolyzed to the corresponding 3'-nucleoside phosphate.

Ribonuclease A has a molecular weight of 13,700 daltons. It operates in an optimum pH range of 7.0 - 7.5. Since Molecular Biology Grade Ribonuclease A (Code: RPDF) is essentially free of DNase and protease activities, this product is useful in removing RNA from DNA in nucleic acid work and where other enzymes are used or where intact proteins must be recovered. RNase B has the same primary sequence as RNase A but has a single N-linked oligosaccharide attached at Asn<sup>34</sup> containing two N-acetylglucosamine and 5-9 mannose residues. Ribonuclease is inhibited by heavy metal ions and it is competitively inhibited by DNA. The inhibitory effect of denatured DNA is much greater than that of native nucleic acid. The enzyme is assayed according to the method of Kalnitsky et al., (1959). The rate of hydrolysis of yeast RNA at pH 5.0 is determined by measuring the amount of acid soluble oligonucleotide released under defined conditions.

**Stability:** **Product Code: RPDF** is stable at least 2 years at 2 - 8°C or -20°C. **Product Code: RASE** is stable 2-3 years at -20°C. **RT1** and **RT2** are stable at 12-18 months at 2-8°C. Other grades of RNase A are stable 2-3 years at 2 - 8°C.

**Storage:** **Codes: R, RB, RAF, RT1L and RTR2:** Store at 2 - 8° C. Protect from moisture. **Code: RASE:** Store at -20°C to maintain monomeric form. **Code: RPDF** and **RT1S:** Store at 2 - 8°C.

**Unit Definitions: RNase A/RNase B:** 1 unit causes an increase in absorbance of 1.0 at 260 nm at 37°C and pH 5.0 when yeast ribosomal RNA is hydrolyzed to acid soluble oligonucleotides. **One Kunitz unit equals 50 Worthington units.**

**Code: RT1S/RT1L:** One unit releases the equivalent of one A<sub>260</sub> of acid-soluble products at 37°C, pH 7.5, from yeast RNA in 15 minutes. **Code: RT2R:** One unit will cause an increase in absorbance of 1.0 at 260 nm at 37°C, pH 4.5 in 15 minutes.

**Technical Notes:** Special care should be given to handling of the enzyme because of its affinity for glass surfaces.

The enzyme remains active but aggregates upon lyophilization and in solution at temperatures ≥ 2°C at low ionic strength. Heating solutions of RNase A to inactivate DNase may not be satisfactory since RNase activity may be lost if precipitate formation occurs and heat treated DNase may reactivate over time.

Product Code: RPDF is suitable as supplied for applications requiring minimal DNase and protease levels and needs no further treatment. Product Code: RAF can be used without treatment in some applications. To heat-treat RAF, use 10 mM acetate pH 5.0 with or without 15 mM CaCl<sub>2</sub> for 15 minutes at 100°C or longer at 80°C. Product may precipitate if heated at neutral pH. Heat treatment of Product Code: RASE will precipitate product due to the presence of phosphate.

## References

Kalnitsky, G., Hummel, J.P., and Dierks, C.: Some Factors Which Affect the Enzymatic Digestion of Ribonucleic Acid. *J. Biol. Chem.*, 234, 1512 (1959).

## Related Products

Albumin, Nuclease-Free • Deoxyribonuclease I  
 Deoxyribonucleic Acid and Related Products  
 Deoxyribonuclease Recombinant  
 Histones • Lysozyme • Nuclease, Micrococcal • Nuclease, S1  
 Phosphatase, Alkaline • Phosphodiesterase I • Phosphodiesterase II  
 Proteinase K • Reverse Transcriptase, Recombinant HIV • Ribonucleic Acid

**Complete Catalog, Tissue Dissociation Guide  
 and Enzyme Manual available online at:**

**Worthington-Biochem.com  
 TissueDissociation.com**