Certificate of Analysis & Product Manual

DNA & RNA Purification Systems, Electrophoresis Reagents, Polymerase Chain Reaction
Custom Primers and Probes
Hybridization and Detection Reagents

RNase A Solution, DNase Free Molecular Biology Grade

Catalog No. 40-5101-XX

Storage Condition: -20°C

For Research Use Only. Not for use in diagnostic procedures for clinical purposes

Gene Link, Inc. 190 Saw Mill River Road, Hawthorne, NY 10532, USA | www.genelink.com | support@genelink.com

Material Supplied

Content	Catalog No.	Description	Size
❑	40-5101-02	RNase A Molecular biology grade solution. DNase Free. 2 mg/mL; 200 µL	400 µg
❑	40-5101-10	RNase A Molecular biology grade solution. DNase Free. 2 mg/mL; 1 mL	2 mg
❑	40-5101-01	RNase A Molecular biology grade solution. DNase Free. 10 mg/mL; 1 mL	10 mg

Storage: Shipped on ice. Store at -20°C

Certificate of Analysis & Product Specifications

Enzyme Name:	RNase A
Source:	Bovine pancreas
EC Number:	3.1.27.5
Molecular Weight:	13,700 Da
Solution Form:	50mM Tris-HCl pH 7.4 and 50% glycerol
Concentration:	30 units/ µl [approximately 6 mg/ml]
Unit Definition:	One Kunitz unit of RNase A is the amount of enzyme required to cause an increase in absorbance of 1.0 at 260 nm at 37°C (pH 5.0) when yeast rRNA is hydrolyzed to acid-soluble oligonucleotides. Fifty units are approximately equivalent to 1 Kunitz unit
Purity:	The enzyme is chromatographically purified and is tested for protease and DNase activities.
Quality Control Tests:	The absence of DNase and proteases confirmed by appropriate quality tests. Functionally tested for RNA digestion in a plasmid DNA purification procedure.

This preparation does not require the classic boiling of RNase A solution to inactivate DNase. Boiling is not recommended.

Supplied in ready to use solution of 2 mg/mL in 50mM Tris-HCl pH 7.4 and 50% glycerol; 4 µL is sufficient for routine RNase treatment to digest RNA in 1.5 mL plasmid mini preps. A high concentration solution of 10 mg/ml is also available.

Product Description:

RNase A is purified from bovine pancreas. RNase A is an endonuclease that specifically cleaves single-stranded RNA at 3' phosphate linkages of pyrimidine (uracil or cytosine) residues leaving pyrimidine 3' phosphates and RNA oligonucleotides with terminal pyrimidine 3' phosphates. This enzyme does not require co-factors and divalent cations for the activity and it does not hydrolyze DNA as DNA lacks 2'-OH groups essential for the formation of cyclic intermediates.

Supplied in ready to use solution of 2 mg/mL in 50mM Tris-HCl pH 7.4 and 50% glycerol; 4 µL is sufficient for routine RNase treatment to digest RNA in 1.5 mL plasmid mini preps. A high concentration solution of 10 mg/ml is also available.

Applications and Recommended Product Use:

RNase A applications include protocols to hydrolyze RNA to RNA oligonucleotides and is generally used in plasmid and genomic DNA purification protocols to eliminate carry over RNA. Specific applications include RNase protection assay to RNA sequence analysis.

Supplied in ready to use solution in 50% glycerol (50mM Tris-HCl pH 7.4 and 50% glycerol). 1 µL (30 units/µL) is sufficient for routine RNase treatment to digest RNA in 1.5 mL plasmid mini preps.

This preparation does not require the classic boiling of RNase A solution to inactivate DNase. Boiling is not recommended.

The enzyme is active under a wide range of reaction conditions. At low salt concentrations (0 to 100mM NaCl), RNase A cleaves single-stranded and double-stranded RNA as well the RNA strand in RNA-DNA hybrids. However, at NaCl concentrations of 0.3M or higher, RNase A specifically cleaves single-stranded RNA.

RNase A Inhibitors. The most potent inhibitor is a ~50kDa protein from cytosol of mammalian cells, e.g. natural RNase inhibitor. Other inhibitors: uridine 2',3'-cyclic vanadate, 5'-diphosphoadenosine 3'-phosphate and 5'-diphosphoadenosine 2'-phosphate, SDS, diethyl pyrocarbonate, 4M guanidinium thiocyanate plus 0.1M 2mercaptoethanol and heavy metal ions.
RNase A activity survives boiling and thus complete inactivation is performed by phenol extraction, chaotropic salts, autoclaving of reagents and labware etc.

References:

1. Sambrook, J., Russell, D. W. (2001) *Molecular Cloning: A Laboratory Manual*, the third edition, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York, 7.63-7.74.
2. Sharma, R. C., Murphy. A. J., De Wald, M. G. and Schimke, R. T. (1993) *BioTechniques*, **14**, 176-178.
3. Ausubel, F.M., et al., Current Protocols in Molecular Biology, vol. 1, John Wiley & Sons, Inc., Brooklyn, New York, 3.13.1, 1994-2005.
4. Kunitz, M.A., A spectrophotometric method for the measurement of ribonuclease activity, J. Biol. Chem., 164, 563-568, 1946.

Ordering Information

Product	Catalog No.	Size
RNase A solution, DNase Free. 2 mg/mL; 200 µL	40-5101-02	400 µg
RNase A solution, DNase Free. 2 mg/mL;; 1 mL	40-5101-10	2 mg
RNase A solution, DNase Free. 10 mg/mL; 1 mL	40-5101-01	10 mg
DNase I, RNase-free; 2u/µL	40-5111-05	500 units
Proteinase K; 10 mg/mL	40-5203-02	200 µL
Lytic Enzyme; 4000 units/mL	40-5205-02	200 µL
Glycogen Solution; 10 mg/mL	40-5112-01	1 mL
Linear Acrylamide (Linear polyacrylamide, LPA; 5mg/mL); 1 mL	40-5113-01	1 mL

Related Products Ordering Information

PCR Kits & Reagents		
Product	**Catalog No.**	**Size**
Taq DNA Polymerase; 400 units; 5 µ/µL; 80 µL	40-5200-40	400 units
Taq PCR Kit; 200 x 50 µL reactions	40-5211-01	200 reactions
Taq PCR Kit with controls; 200 reactions	40-5212-01	200 reactions
PCR Master Mix (2X); 100 x 50 µL reactions (2 tubes x 1.3 mL)	40-5213-01	100 reactions
PCR Master Mix (2X); 200 x 50 µL reactions (4 tubes x 1.3 mL)	40-5213-02	200 reactions

PATENTS/DISCLAIMER: Some applications in which this product can be used may be covered by patents issued and applicable in the United States and certain other countries. Because purchase of this product does not include a license to perform any patented application, users of this product may be required to obtain a patent license depending upon the particular application in which the product is used. The PCR process was the subject of United States patents that expired on March 29, 2005 and European Patent Nos. 201,184 and 200,262 that expired on March 28, 2006.

Related Products Ordering Information

DNA & RNA Reconstitution Solutions

Product	Catalog No.	Unit Size
DNA & RNA Reconstitution Solutions Pack (contains 50 mL each of DEPC Treated Water, Nuclease Free Water (DEPC Free), TE pH 7.0 and RNA Reconstitution Solution)	40-3000-00	1 Pack
RNA Reconstitution Solution (1 mM Sodium Citrate pH 6.4) 10 X 1.6 mL	40-5014-16	10 X 1.6 mL
RNA Reconstitution Solution (1 mM Sodium Citrate pH 6.4); 50 mL	40-5014-05	50 mL
TE Buffer 1X solution pH 7.0; 50 mL	40-5011-05	50 mL
TE Buffer 1X solution pH 7.5; 50 mL	40-5012-05	50 mL
TE Buffer 1X solution pH 8.0; 50 mL	40-5013-05	50 mL
Nuclease Free Water (DEPC Free) 10 X 1.6 mL	40-3001-16	10 X 1.6 mL
Nuclease Free Water (DEPC Free) 50 mL	40-3001-05	50 mL
Nuclease Free Water (DEPC Free) 500 mL	40-3001-50	500 mL
Nuclease Free Water (DEPC Free); 1L	40-3001-01	1 L
DEPC Treated Water; 10 X 1.6 mL	40-3000-16	10 X 1.6 mL
DEPC Treated Water; 50 mL	40-3000-05	50 mL
DEPC Treated Water; 500 mL	40-3000-50	500 mL
DEPC Treated Water; 1L	40-3000-01	1 L

DNA & RNA Precipitation Solutions

Product	Catalog No.	Unit Size
DNA & RNA Precipitation Pack (contains the following; Glycogen Solution 10 mg/mL; 1 mL; LiCl RNA Precipitation Solution; Sodium Acetate DNA & RNA Precipitation Solution; Sodium Chloride DNA & RNA Precipitation and Ammonium Acetate DNA & RNA Precipitation Solution)	40-5130-00	1 Pack
Glycogen Solution 10 mg/mL; 1 mL	40-5112-01	1 mL
Linear Acrylamide (Linear polyacrylamide, LPA; 5mg/mL); 1 mL	40-5113-01	1 mL
LiCl RNA Precipitation Solution (7.5M LiCl, 50 mM EDTA pH 8.0); 50 mL	40-5131-05	50 mL
Sodium Acetate 3M, DNA & RNA Precipitation Solution ; 50 mL	40-5132-05	50 mL
Potassium Acetate 3M, DNA & RNA Precipitation Solution; 50 mL	40-5133-05	50 mL
Sodium Chloride 5M, DNA & RNA Precipitation Solution; 50 mL	40-5134-05	50 mL
Ammonium Acetate 7.5M, DNA & RNA Precipitation Solution ; 50 mL	40-5135-05	50 mL
Ammonium Acetate 5M, DNA & RNA Precipitation Solution; 50 mL	40-5136-05	50 mL

PCR Additives & Reagents

Product	Catalog No.	Unit Size
Taq DNA Polymerase 300 units; 5 µ/µl; 60 µl	40-5200-30	300 units
PCR Buffer Standard (10 X)	40-3060-16	1.6 mL
PCR Buffer Mg Free (10 X)	40-3061-16	1.6 mL
Taq Polymerase Dilution Buffer; 1 ml	40-3070-10	1 mL
dNTP 2mM (10X)	40-3021-11	1.1 mL
$MgCl_2$; 25 mM	40-3022-16	1.6 mL
Omni-Marker™ Universal Unlabeled	40-3005-01	100 µL
Primer and Template Mix; 500 bp; 40 reactions	40-2026-60PT	100 µL
Nuclease Free Water, 10 X 1.6 mL	40-3001-16	10 X 1.6 mL
DMSO, 1 mL	40-3031-10	1 mL
TMAC (Tetramethyl ammonium chloride) 100 mM	40-3053-10	1 mL
KCl 300 mM	40-3059-10	1 mL
Betaine; 5M	40-3032-10	1 mL

Electrophoresis Buffers & Reagents

Product	Catalog No.	Unit Size
Agarose LE Molecular Biology Grade; 100 g	40-3010-10	100 g
Agarose LE Molecular Biology Grade; 500 g	40-3010-50	500 g
Hybwash A, Hybridization Wash Solution	40-5020-20	200 mL
Hybwash B, Hybridization Wash Solution	40-5021-10	100 mL
TAE Buffer; 50X Concentrate; 100 mL	40-3007-01	100 mL
TAE Buffer; 50X Concentrate; 1000 mL	40-3007-10	1000 mL
TBE Buffer; 5X Concentrate	40-3008-10	1000 ml
10% Blocking solution	40-5026-10	100 mL
10x AP Detection buffer	40-5031-10	100 mL
Lumisol™ I Hybridization Solution; contains formamide	40-5022-20	200 mL
Lumisol™ II Hybridization Solution; for non-toxic hybridizations	40-5023-20	200 mL
Lumisol™ III Hybridization Solution; for oligo probes	40-5024-20	200 mL

Loading Buffers

Product	Catalog No.	Unit Size
Loading Buffer 5X BPB/XC non-denaturing	40-3002-10	1 mL
Loading Buffer 5X Orange G/XC non-denaturing	40-3004-10	1 mL
Loading Buffer 2X BPB/XC Denaturing for Sequencing	40-5027-10	1 mL

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