



# Enzymes/Enzyme Inhibitors/Reagents

Extremely Economical High Quality Enzymes/Enzyme Inhibitors/Reagents

## Introduction

When working with RNA, care must be taken to create a ribonuclease-free environment. In the laboratory, obtaining full length, high quality RNA can be challenging. Those little, nearly indestructible RNases are everywhere – on your skin and mucous membranes, in the water and some of the enzymes you use, on lab surfaces, even in airborne microbes! RNases are very stable and difficult to inactivate. To ensure success, it is important to maintain an RNase-free environment starting with RNA purification and continuing through analysis.

Real Biotech Corporation provides a wide selection of extremely economical and high quality enzymes, enzyme inhibitors and reagents. Choose from the table below for the most suitable one for your application. If none is suitable, please inquire local distributor or Real Biotech Corporation.

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## Popular RNA Products

### Sample Preservation: RNAsstill™ RNA Stabilization Reagent

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RNAsstill™ RNA Stabilization Reagent is a non-toxin aqueous tissue and cells storage reagent that rapidly permeates most tissues to stabilize and protect RNA in fresh specimens. RNAsstill™ RNA Stabilization Reagent eliminates the need to immediately process or freeze samples; the specimen can simply be submerged in RNAsstill™ RNA Stabilization Reagent and stored for analysis at a later date.

The stability of sample which preserved in RNAsstill™ RNA Stabilization Reagent are stable for 1 day at 37°C, 1 week at room temperature, 1 month at 4°C and indefinitely at -20°C. This reagent is suitable for various samples from animal & plant tissues, culture cells and bacteria without using liquid nitrogen or -80°C freezer. The purified RNA is high quality and intact as stored in liquid nitrogen.

### Cleaning Work Surfaces, Equipment and Labware: RNAarmor™ RNase/DNase Removal Reagent

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RNAarmor™ RNase/DNase Removal Reagent is a ready-to-use reagent ideal for eliminating RNase and DNase contamination from glassware, plastic surfaces, countertops or pipettors. By soaking, wiping or spraying, then rinsing or wiping the surface dry, RNase and DNase can be efficiently removed without leaving any residue to interfere with subsequent DNA & RNA samples. Furthermore, RNAarmor™ RNase/DNase Removal Reagent works more effectively in degrading RNA and DNA than autoclave.

RNAarmor™ RNase/DNase Removal Reagent is non-carcinogenic, non-abrasive and non-biologically corrosive. It's a perfect replacement for DEPC, a known carcinogen. It's also a perfect replacement for autoclave. RNAarmor™ RNase/DNase Removal Reagent is proven to be ideal for cleaning work surfaces, pipettors, equipment, gel boxes, benchtops and labware that cannot be autoclaved. By using RNAarmor™ RNase/DNase Removal Reagent, RNase & DNase removal process can be safe, fast and simple.

### RNA Purification: RNA Extraction Kits & RNA Isolation Kits

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RNA purification based on the column format, please refer to page G-42.

RNA purification based on the reagent format, please refer to page R-13 to R-20.

### Inhibition of RNA Degradation: RNAarmor™ RNase Inhibitor

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RNAarmor™ RNase Inhibitor is a recombinant human placental protein which specifically inhibits RNase A and other eukaryotic RNase A-like proteins. RNAarmor™ RNase Inhibitor does not inhibit RNA polymerases, DNA polymerases, RNase H, or RNase T1. RNAarmor™ RNase Inhibitor is rigorously tested to be a nuclease-free reagent and is guaranteed free of nonspecific endonuclease, exonuclease, and RNase activity. Therefore, RNAarmor™ RNase Inhibitor is often used to inhibit the activity of RNases. It's ideal for use in cDNA synthesis, RT-PCR reactions, in vitro transcription, in vitro translation, cDNA library construction, as well as for long-term storage of RNA samples.

### Completely Eliminating RNases Contamination during RNA Storage: RNAsstill™ RNA Storage Solution

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RNAsstill™ RNA Storage Solution is supplied in a 20-fold concentrated, ready-to-use reagent which is ideal for decontamination of RNases and storage of purified RNA. RNAsstill™ RNA Storage Solution provides greater RNA stability than standard 0.1mM EDTA, TE Buffer or other commercial reagent. Some commercial reagent will inhibit Reverse Transcription when the RT temperature is more than 45°C. However, RNAsstill™ RNA Storage Solution will not inhibit reverse transcription even when the RT temperature is up to 65°C. Furthermore, RNases-inactivation process can be repeated anytime to protect against newly introduced contaminants. Multiple reheating steps will not affect the efficiency of RNAsstill™ RNA Storage Solution. RNAsstill™ RNA Storage Solution is non-toxic. It's a perfect replacement for DEPC, a known carcinogen. It's also a perfect replacement for buffer incompatible with DEPC, or solution cannot be autoclaved.

# Purification Enzymes

High quality molecular biology grade enzymes at economical pricing



## Proteinase K

Molecular Biology Grade

Store at  
2~8°C

Cat. No. YPK100

Proteinase K (34 U/mg): 100 mg

Cat. No. YPK500

Proteinase K (34 U/mg): 500 mg

Cat. No. YPK1G

Proteinase K (34 U/mg): 1 g

**Format:** Lyophilized powder

**Source:** *Tritirachium album limber* (Recombinant)

**Purity:** Over 99.5% (Native-PAGE and laser scan assay)

**Activity:** >30 units/mg protein (hemoglobin, pH7.5, 37°C)

## Description

Proteinase K is a stable and highly reactive serine protease. It is active with SDS, urea and EDTA and it is strongly inhibited by PMSF.

## Applications

Proteinase K is active over the pH range 4~12. It can be used in:

- (1) Proteolytic inactivation of nucleases during the isolation of DNA/RNA,
- (2) Inactivation of RNases, DNases and enzymes in reactions,
- (3) Improving cloning efficiency of PCR products,
- (4) Preparation of tissue sections for in situ hybridization...etc.

## Unit definition

One unit liberates Folin-positive amino acids and peptides corresponding to 1  $\mu$ mol tyrosine in 1 minute at 37°C using denatured hemoglobin as substrate.

## Quality Control

DNases: (not detected).

RNases: (not detected).

Exonucleases: (not detected).

## Storage Conditions

Proteinase K shall be stored at 4°C in a constant refrigerator and protected from moisture.



## RNase A

Molecular Biology Grade

Store at  
-20°C

Cat. No. YRN100

RNase A (≥ 60 U/mg): 100 mg

Cat. No. YRN250

RNase A (≥ 60 U/mg): 250 mg

Cat. No. YRN500

RNase A (≥ 60 U/mg): 500 mg

Cat. No. YRN1G

RNase A (≥ 60 U/mg): 1 g

**Format:** Lyophilized powder (salt-free)

**Source:** Bovine pancreas from various locations, USDA approved

**Purity:** ≥95% by SDS-PAGE (chromatographically purified)

**Activity:** ≥ 60 units/mg protein according to Kunitz (37°C)

## Description

RNase A is from Bovine pancreas (BSE-free sources) and it is a chromatographically purified, pyrimidine-specific endoribonuclease that acts on single-stranded RNA.

## Applications

Removal of RNA from plasmid DNA preparation or recombinant protein preparation.

Removal of unspecifically bound RNA.

Mapping single-base mutations in DNA/RNA.

RNase protection assays.

## Unit definition

One unit is defined as the amount of enzyme that will catalyze the hydrolysis of RNA to yield a first-order velocity constant equal to 1.0 at 25°C, pH 5.0.

## Quality Control

DNases: (not detected).

RNases: (not detected).

Exonucleases: (not detected).

## Storage Conditions

RNase A shall be stored at -20°C in a constant freezer and protected from moisture.

# Purification Enzymes

High quality molecular biology grade enzymes at economical pricing



## Lysozyme

Molecular Biology Grade



Cat. No. YLY20

Lysozyme (>50 KU/mg): 20 mg

Cat. No. YLY100

Lysozyme (>50 KU/mg): 100 mg

Cat. No. YLY500

Lysozyme (>50 KU/mg): 500 mg

Cat. No. YLY1G

Lysozyme (>50 KU/mg): 1 g

## Description

Lysozyme efficiently hydrolyses many bacterial cell walls, including *Micrococcus luteus*, *acillus subtilis* and *Escherichia coli*.

## Applications

Breaking down the cell walls of bacteria.

Preparing spheroplasts.

Detection of BSE forming proteins uniquely resistant to proteolytic cleavage.

Analysis of membrane structure.

## Unit definition

One unit is defined as the amount of enzyme that causes a decrease of 0.001 A<sub>450</sub> unit per minute at 25°C, pH 6.2, using a suspension of *Micrococcus lysodeikticus* as the substrate.

## Quality Control

DNases: (not detected).

RNases: (not detected).

Exonucleases: (not detected).

## Storage Conditions

Lysozyme shall be stored at -20°C in a constant freezer.



## DNase I (RNase-Free)

Molecular Biology Grade



Cat. No. YDN02

DNase I (2,000 units/ml): 500 µl x 2

DNase I Reaction Buffer: 5 ml x 2

Cat. No. YDN10

DNase I (2,000 units/ml): 500 µl x 10

DNase I Reaction Buffer: 5 ml x 10

Cat. No. YDN20

DNase I (2,000 units/ml): 500 µl x 20

DNase I Reaction Buffer: 5 ml x 20

Cat. No. YDN60

DNase I (2,000 units/ml): 500 µl x 60

DNase I Reaction Buffer: 5 ml x 60

## Description

DNase I is guaranteed RNase-free and it's provided in RNase-free storage buffer. DNase I is a chromatographically purified, pyrimidine-specific endoribonuclease that degrades both single-stranded and double-stranded DNA, leaving RNA intact. It's commonly used for DNA digestion in RNA related applications.

## Applications

Removal of DNA from protein and RNA preparations.

Single- and double-stranded DNA digestion in RNA purification.

Removal of contaminating genomic DNA from RNA samples.

Degradation of DNA template in transcription reactions.

Nick translation of DNA, DNA footprinting and mapping of DNase I sensitive sites.

## Unit definition

One unit is defined as the amount of enzyme that causes an increase in A<sub>260</sub> of 0.001 per minute per milliliter at 25°C, pH 5.0, with highly polymerized DNA as the substrate.

## Quality Control

RNases: (not detected).

## Storage Conditions

DNase I (RNase-Free) shall be stored at -20°C in a constant freezer and protected from frequent temperature changes.

# RNAarmor™ RNase Inhibitor



**Cat. No. YRI001**

**2,000 units/kit**

**RNAarmor™ RNase Inhibitor (40U/ul) : 500 ul**



*Efficiently inhibits RNase A and other eukaryotic RNase A-like proteins*

*Compatible with Taq Polymerase, AMV or M-MuLV Reverse Transcriptases!*

## Description

RNAarmor™ RNase Inhibitor is a recombinant human placental protein which specifically inhibits RNase A and other eukaryotic RNase A-like proteins. RNAarmor™ RNase Inhibitor does not inhibit RNA polymerases, DNA polymerases, RNase H, or RNase T1. RNAarmor™ RNase Inhibitor is rigorously tested to be a nuclease-free reagent and is guaranteed free of nonspecific endonuclease, exonuclease, and RNase activity. Therefore, RNAarmor™ RNase Inhibitor is often used to inhibit the activity of RNases.

It's ideal for use in cDNA synthesis, RT-PCR reactions, in vitro transcription, in vitro translation, cDNA library construction, as well as for long-term storage of RNA samples.

## Features

Specifically inhibits RNase A and other eukaryotic RNase A-like proteins.  
Does not inhibit RNA polymerases, DNA polymerases, RNase H, or RNase T1.  
Free of nonspecific endonuclease, exonuclease, and RNase activity.  
Compatible with Taq Polymerase, AMV or M-MuLV Reverse Transcriptases.

## Product Source

An E. coli strain that carries the Ribonuclease Inhibitor gene from human placenta.

## Definition of Activity Unit

One unit of the RNAarmor™ RNase Inhibitor inhibits the activity of 5 ng of RNase A by 50%.

## Storage Buffer

RNAarmor™ RNase Inhibitor is supplied in 20mM HEPES-KOH (pH 7.6), 50mM KCl, 5mM DTT and 50% glycerol.

## Quality Control

RNAarmor™ RNase Inhibitor is rigorously tested to be free of nonspecific endonuclease, exonuclease, and RNase activity.

## Applications

Ideal for RNA purification and storage.

Ideal for inhibition of RNA degradation in following applications:

- (1) in vitro transcription,
- (2) cDNA synthesis,
- (3) in vitro translation,
- (4) isolation of mammalian cell fractions that contain mRNA-protein complex,
- (5) RNA amplification...etc.

## Storage Conditions

RNAarmor™ RNase Inhibitor shall be shipped and stored at -20°C.

# RNAarmor™ RNase/DNase Removal Reagent



Eliminating RNase and DNase contamination from countertops or pipettors

Perfect replacement for DEPC and autoclave!



**Cat. No. YRD100**

100 ml / kit (Liquid in Spray Bottle)

RNAarmor™ RNase/DNase Removal Reagent: 100 ml

**Cat. No. YRD500**

500 ml / kit (Liquid in Spray Bottle)

RNAarmor™ RNase/DNase Removal Reagent: 500 ml

**Cat. No. YRE500**

500 ml / kit (Liquid in Spray Bottle)

RNAarmor™ RNase Removal Reagent: 500 ml

## Description

RNAarmor™ RNase/DNase Removal Reagent is a ready-to-use reagent ideal for eliminating RNase and DNase contamination from glassware, plastic surfaces, countertops or pipettors. By soaking, wiping or spraying, then rinsing or wiping the surface dry, RNase and DNase can be efficiently removed without leaving any residue to interfere with subsequent DNA & RNA samples. Furthermore, RNAarmor™ RNase/DNase Removal Reagent works more effectively in degrading RNA and DNA than autoclave.

RNAarmor™ RNase/DNase Removal Reagent is non-carcinogenic, non-abrasive and non-biologically corrosive. It's a perfect replacement for DEPC, a known carcinogen. It's also a perfect replacement for autoclave. RNAarmor™ RNase/DNase Removal Reagent is proven to be ideal for cleaning work surfaces, pipettors, equipment, gel boxes, benchtops and labware that cannot be autoclaved. By using RNAarmor™ RNase/DNase Removal Reagent, RNase & DNase removal process can be safe, fast and simple.

## Features

More than 20 µg of RNase can be removed per spray.

Non-carcinogenic, non-abrasive and non-biologically corrosive.

Perfect replacement for DEPC and autoclave.

Leave no residue to interfere with subsequent DNA & RNA samples.

## Applications

Ideal for completely eliminating RNase and DNase contamination from:

- (1) work surfaces,
- (2) equipments,
- (3) glassware,
- (4) plastic surfaces,
- (5) pipettors,
- (6) gel boxes,
- (7) benchtops,
- (8) labware that cannot be autoclaved.

## Quality Control

RNAarmor™ RNase/DNase Removal Reagent is functionally tested for the elimination of RNase and DNase. No detectable RNase activity or DNA is observed.

## Storage Conditions

RNAarmor™ RNase/DNase Removal Reagent shall be shipped and stored at room temperature (15-25°C).



# RNAsstill™ RNA Stabilization Reagent



**Cat. No. YRS100**

**RNAsstill™ RNA Stabilization Reagent : 100 ml**

**Cat. No. YRS250**

**RNAsstill™ RNA Stabilization Reagent : 250 ml**

**Cat. No. YRS500**

**RNAsstill™ RNA Stabilization Reagent : 500 ml**



*Rapidly permeates tissues to stabilize and protect RNA in fresh specimens*

**Convenient and safe handling at room temperature.**

**No need for liquid nitrogen or dry ice.**

## Description

RNAsstill™ RNA Stabilization Reagent is a non-toxin aqueous tissue and cells storage reagent that rapidly permeates most tissues to stabilize and protect RNA in fresh specimens. RNAsstill™ RNA Stabilization Reagent eliminates the need to immediately process or freeze samples; the specimen can simply be submerged in RNAsstill™ RNA Stabilization Reagent and stored for analysis at a later date.

The stability of sample which preserved in RNAsstill™ RNA Stabilization Reagent are stable for 1 day at 37°C, 1 week at room temperature, 1 month at 4°C and indefinitely at -20°C. This reagent is suitable for various samples from animal & plant tissues, culture cells and bacteria without using liquid nitrogen or -80°C freezer. The purified RNA is high quality and intact as stored in liquid nitrogen.

## Features

Immediate RNA stabilization and protection.

Tissue archiving without risk of RNA degradation.

Perfect for tissue collection where immediate RNA isolation is not possible.

Convenient and safe handling at room temperature.

No need for liquid nitrogen or dry ice.

## Applications

Animal tissue, plant tissue, cultured cells, white blood cells and bacteria stabilized in RNAsstill™ RNA Stabilization Reagent can be stored indefinitely at -20°C for analysis at a later date. The purified RNA is high quality and intact as stored in liquid nitrogen.

The stability of sample which preserved in RNAsstill™ RNA Stabilization Reagent are stable for 1 day at 37°C, 1 week at room temperature, 1 month at 4°C and indefinitely at -20°C.

Sample can be thawed and frozen many times without affecting the RNA quality. The low temperature may cause the formation of crystals or a precipitate in the reagent. This will not affect subsequent RNA purification.

## Quality Control

The quality of RNAsstill™ RNA Stabilization Reagent is tested on a lot-to-lot basis against predetermined specifications to ensure consistent product quality.

## Storage Conditions

RNAsstill™ RNA Stabilization Reagent should be stored dry at room temperature (15–25°C).

# RNAskill™ RNA Storage Solution



Repeated inactivation of RNases in a safe, easy-to-use RNA storage solution

**Ideal for decontamination of RNases and storage of purified RNA!**  
 RNases-inactivation can be repeated to protect against newly introduced contaminants.  
 Perfect replacement for DEPC, buffer incompatible with DEPC or solution can't be autoclaved.

Cat. No. **YRR001**

(20X) RNAskill™ RNA Storage Solution : 1 ml



Cat. No. **YRR010**

(20X) RNAskill™ RNA Storage Solution : 10 ml

## Description

RNAskill™ RNA Storage Solution is supplied in a 20-fold concentrated, ready-to-use reagent which is ideal for decontamination of RNases and storage of purified RNA. RNAskill™ RNA Storage Solution provides greater RNA stability than standard 0.1mM EDTA, TE Buffer or other commercial reagent. Some commercial reagent will inhibit Reverse Transcription when the RT temperature is more than 45°C. However, RNAskill™ RNA Storage Solution will not inhibit reverse transcription even when the RT temperature is up to 65°C. Furthermore, RNases-inactivation process can be repeated anytime to protect against newly introduced contaminants. Multiple reheating steps will not affect the efficiency of RNAskill™ RNA Storage Solution.

RNAskill™ RNA Storage Solution is non-toxic. It's a perfect replacement for DEPC, a known carcinogen. It's also a perfect replacement for buffer incompatible with DEPC, or solution cannot be autoclaved. RNA stored in RNAskill™ RNA Storage Solution can be used in many enzymatic reactions, including cDNA synthesis, RT-PCR and in vitro transcription...etc. By using RNAskill™ RNA Storage Solution, decontamination of RNases and storage of purified RNA can be safe, fast and simple.

## Features

RNases-inactivation can be completed by heating the solution at 65°C for 20 minutes.  
 RNases-inactivation can be repeated to protect against newly introduced contaminants.  
 Multiple reheating steps will not affect the efficiency.  
 Perfect replacement for DEPC, buffer incompatible with DEPC or solution can't be autoclaved.  
 RNA can be stored in RNAskill™ RNA Storage Solution at -20°C.

## Applications

Ideal for completely eliminating RNases contamination during RNA storage. If contamination of the sample is suspected at a later date (after using the sample or before refreezing the sample), re-heating will inactivate any new contaminants.

## Quality Control

RNAskill™ RNA Storage Solution is functionally tested for the elimination of RNase. No detectable RNase activity is observed.

## Storage Conditions

RNAskill™ RNA Storage Solution shall be stored at -20°C.

Figure: RT-PCR of rat beta-actin from RNA stored in different solution.

Total RNA isolated from rat spleen was resuspended in RNase-free water.  
 1/3 of RNA was treated with 1X RNasefree.  
 1/3 of RNA was treated with 1X RNAskill.  
 RT-PCR is performed by RealScript One-Step RT-PCR Kit (Cat. No. RR101) with RT temperature at 50°C. The expected PCR product is 513bp.

M: DNA Marker

Lane 1: RNA in RNase-Free Water

Lane 2: RNA in RNasefree

Lane 3: RNA in RNAskill

N: Negative control. RNA in RNase-free water amplified with taq only.

Origin: RBC Labs

