Manual

Ribonuclease R

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

Ribonuclease R, *E. coli* is part of the Epicentre™ product line, known for its unique genomics kits, enzymes, and reagents which offer high quality and reliable performance.

BIOSEARCH™ TECHNOLOGIES

GENOMIC ANALYSIS BY LGC

Manual

Ribonuclease R

1. Introduction

Ribonuclease R (RNase R) from *E. coli*, is a magnesium-dependent 3′→5′ exoribonuclease that digests essentially all linear RNAs but does not digest lariat or circular RNA structures.[1,2] Most cellular RNAs will be digested completely by RNase R, with the exception of tRNAs, 5S RNA and intron lariats. The 3′-tails of lariats will be trimmed by RNase R to the branch point nucleotide, where there is a 2′,5′-phosphodiester linkage.

The MasterPure™ Complete DNA and RNA Purification Kit and MasterPure Yeast RNA Purification Kits are ideal for total RNA purifications. RNA isolated in this way can be used as a template to produce labelled cDNA which is then used as a target for microarrays containing potential intron sequences or for tiling arrays containing overlapping regions of complete chromosomes or genomes. The cDNA produced in this way will not be a linear representation of the intron, but the sequences contained in it will be intron-derived. RNase R digests linear RNAs to enrich for circular RNAs used for protein production or intronic cDNA library construction.[3,4,5,6]

2. Product designations and kit components

Product	Kit size	Catalogue number	Reagent description	Part number	Volume
RNase R	250 units	RNR07250	Ribonuclease R (20 U/µL)	E0111-20D1	12.5 µL
			10X RNase R Reaction Buffer	SS000769-D1	250 µL
	2500 units	RNR072500	Ribonuclease R (20 U/µL)	E0111-20D3	125 µL
			10X RNase R Reaction Buffer	SS000769-D3	2.5 mL

3. Product specifications

Storage: Store only at -20 °C in a freezer without a defrost cycle.

Storage buffer: RNase R is supplied in a 50% glycerol solution containing 50 mM Tris-HCl (pH 7.5), 100 mM NaCl, 0.1 mM EDTA, 0.1% Triton X-100 and 1 mM dithiothreitol.

Unit definition: One unit converts 1 µg of poly-r(A) into acid-soluble nucleotides in 10 minutes at 37 °C in 20 mM Tris-HCl (pH 8.0), 100 mM KCl and 0.1 mM $MgCl_2$.

10X RNase R Reaction Buffer: 0.2 M Tris-HCl (pH 8.0), 1 M KCl and 1 mM $MgCl_2$.

NOTE: *RNase R requires low (0.1-1.0 mM) magnesium concentrations for activity. Low EDTA concentrations in substrate RNA solutions can negatively affect RNase R activity. Additional $MgCl_2$, up to 1 mM final concentration can be used to compensate for EDTA in the substrate. Optimal activity is at 37 °C.*

Contaminating activity assays: RNase R is free of detectable endoribonuclease and DNase activities.

4. Applications

- Removal of precursor linear RNA after circularisation of RNA for enhanced protein production
- Alternative splicing studies
- Gene expression studies
- Intron cDNA production
- Intronic screening of cDNA libraries
- Isolation of splicing intermediates and lariats

5. References

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3. Xiao M-S and Wilusz JE (2019). *Nucleic Acids Res* 47(16), 8755-8769.
4. Chasseur, A. S., et al. (2022). *J. Virol*, 96 (9), e00321-22.
5. Chen, R., Wang, S.K., Belk, J.A. et al. (2022). *Nat Biotechnol* 41, 262-272.
6. Breuer J, Barth P, Noe Y, et al. (2022). *Mol. Ther. Nucleic Acids*, 28, 623-635.

6. Further support

If you require any further support, please do not hesitate to contact our Technical Support Team: techsupport@lgcgroup.com.

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