One-Step DNA & RNA Removal Kit

Introduction

BcMag™ One-Step DNA & RNA Removal Kit uses endonuclease -immobilized magnetic beads to remove DNA and RNA from sample using a single step protocol. The recombinant endonuclease is encoded by the same gene of Merck Benzonase nuclease or TurboNuclease) of Serratia macescens produced in *E. coli*. This nuclease nonspecifically digests all kinds of DNA and RNA, including variants of single- and double-stranded, circular, linear, or supercoiled DNA and RNA to 5'-phosphorylated oligonucleotides of 2-8 bases in length and is free of protease activity. The nuclease immobilized magnetic bead can efficiently remove all the nucleic acids (DNA and RNA) from protein solution with *no* endonuclease remaining in the solution due to the nuclease stably and covalently conjugated with the magnetic Beads.

Applications

An immobilized nuclease bead is ideal for removing nucleic acid contamination from purified proteins or other sample preparations.

Features and Advantages:

- Efficient one-tube and extraction-free protocol (Fig.1).
- Ultrafast: Process 96 samples in less than 30 minutes with <10-second Hands-on Time
- Nuclease Recovered at the end of the reaction thereby can be reused.
- Easy separation of the endonuclease from the protein sample.
- Stability of the immobilized endonuclease increases.
- Cost-effective: Eliminates columns, filters, laborious, organic reagents, and minimal plasticware required.
- High throughput: Compatible with many different automated liquid handling systems.

Workflow

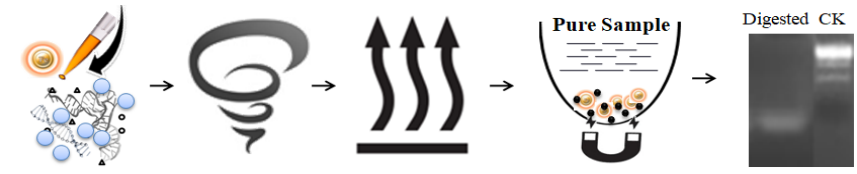

Fig.1

Formulation: Liquid (Supplied in 50 mM Tris-HCl, pH 8.0, 50 mM NaCl, 5 mM $MgCl_2$ and 50% Glycerol.)

Activity: 1 µl Magnetic Beads will digest 10µg of sonicated *salmon* sperm DNA *to* acid-soluble oligonucleotides *in* 50 mM Tris-HCl, pH 8.0, 50 mM NaCl, 2 mM $MgCl_2$ in 30 minutes at 37 °C.

Shipping: Shipped at ambient temperature (stable for at least 20 days at room temperature). Upon receipt, store nuclease magnetic Beads at -20°C. Aliquot to avoid repeated freezing and thawing.

Products	Catalog # AV-101	Catalog # AV-102
BcMag™ One-Step DNA & RNA Removal Kit	1 ml	3 ml

PROTOCOL

A. **Accessory equipment**

Magnetic Rack

Item	Source
Magnetic Rack for centrifuge tube ** Based on sample volume, the user can choose one of the following magnetic Racks	• BcMag Rack-2 for holding two individual 1.5 ml centrifuge tubes (Bioclone, Cat. # MS-01) • BcMag Rack-6 for holding six individual 1.5 ml centrifuge tubes (Bioclone, Cat. # MS-02) • BcMag Rack-24 for holding twenty-four individual 1.5-2.0 ml centrifuge tubes (Bioclone, Cat. # MS-03)

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	• BcMag Rack-50 for holding one 50 ml centrifuge tube, one 15 ml centrifuge tube, and four individual 1.5 ml centrifuge tubes (Bioclone, Cat. # MS-04)
BcMag 96-well Plate Magnetic Rack.	• BcMag 96-well Plate Magnetic Rack (side-pull) compatible with 96-well PCR plate and 96-well microplate or other compatible Racks (Blioclone, Cat#: MS-05)

B. Procedure

- Do not use buffers containing organic solvents.
- Typically, the bead is added directly into any standard buffer at the desired amount of the beads based on the concentration of the contaminated nucleic acids. However, for the best results, users should reference the following table.

Table1. Working Condition

Conditions	Optimal Function	Functional Range	Inhibitory Action
Mg^{2+}	1-2 mM	1–9 mM	N/A
Dithiothreitol (DTT)	0–95 mM	>100 mM	N/A
2-Mercaptoethanol	0–90 mM	>100 mM	N/A
Temperature	37 ℃	0–50 ℃	N/A
Monovalent cation (Na+, K+, etc.)	0–20 mM	0–150 mM	N/A
pH	8.0–9.0	6.0–10.0	N/A
PMSF	1 mM		
$CaCl_2$	N/A	N/A	100 mM reduces 75% enzyme activity
1M NaCl	N/A	N/A	1 M reduces 75% enzyme activity
Guanidine HCl	N/A	N/A	100 mM, completely inhibits enzyme activity
EDTA	N/A	N/A	1mM reduces 30% enzyme activity. 100 mM can completely inactivate the enzyme activity

1. Shake the bottle to completely resuspend the Magnetic beads until it is homogeneous.
   IMPORTANT! It is important to mix the beads before dispensing. Do not allow the beads to sit for more than 2 minutes before dispensing. Resuspend the magnetic beads every 2 minutes.
2. Add an appropriate amount of the magnetic beads to a protein sample containing nucleic acids.
3. Mix the sample with beads for 1-2 minutes by slowly pipetting up and down 20-25 times *or* Vortex the sample for 2 minutes at 2000 rpm.
4. Incubate at 37°C with continuous rotation for 30 minutes.
5. Place the sample plate or tube on the magnetic Rack for 30 seconds or until the solution is clear.
   (Option: centrifuge at 3500 rpm for 45 seconds)
6. Transfer the supernatant to a clean plate /tube while the sample plate remains on the magnetic separation plate. The sample is ready for downstream applications.

Reference

1. Lehman, I.R., Nussbaum A.L., The deoxyribonucleases of Escherichia coli. V. On the specificity of exonuclease I (phosphodiesterase), J. Biol. Chem., 239, 2628-2636, 1964.
2. Werle, E., et al., Convenient single-step, one tube purification of PCR products for direct sequencing, Nucleic Acids Res., 22, 4354-4355, 1994.
3. Nabavi S., Nazar R.N., Simplified one tube “megaprimer” polymerase chain reaction mutagenesis, Anal Biochem., 2, 346- 348, 2005.
4. Rosamond, J., et al., Modulation of the action of the recBC enzyme of Escherichia coli K-12 by Ca2+, J. Biol. Chem., 254, 8646-8652, 1979.
5. Sasaki, Y., Miyoshi, D. and Sugimoto, N., Regulation of DN nucleases by molecular crowding., Nucleic Acids Res., 35, 4086-4093, 2007.
6. References 1. Lehman, I.R. and Nussbaum, A.L. (1964) J. Biol. Chem. 239, 2628. 2. Kusher, S.R. et al., (1971) Proc. Natl. Acad. Sci. USA 68, 824. 3. Kusher, S.R. et al., (1972) Proc. Natl. Acad. Sci. USA 69, 1366. 4. Goldmark, P.J. and Linn, S. (1972) J. Biol. Chem. 247, 1849. 5. Rosamond, J. et al., (1979) J. Biol. Chem. 254, 8646.

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Related Products

Products and Catalog Number	
Genomic DNA and RNA Purification	
One-Step Mammalian Cell DNA Purification Kit, Cat. No. AA101	One-Step Saliva Viral RNA-DNA Purification Kit, Cat. No. AR101
Cell-Free DNA Purification Kit, Cat. No AC101	Bone-Teeth DNA Purification Kit, Cat. No. AB101
One-Step FFPE & FNA DNA purification Kit, Cat. No. AJ-101	Rootless Hair DNA Purification Kit**,** Cat. No. AD101
One-Step Bacteria DNA Purification Kit, Cat. No. AE101	One-Step Buccal Cell DNA Purification Kit, Cat. No. AG101
One-Step Blood DNA Purification Kit, Cat. No. AF101	One-Step Touch DNA Purification Kit, Cat. No. AS101
One-Step Fungi &Yeast DNA Purification Kit, Cat. No. AL101	Sexual Assault Casework DNA Purification Kit, Cat. No. AT101
One-Step Insect DNA Purification Kit, Cat. No. AM101	One-Step Fingerprint DNA Purification Kit, Cat. No. AZ101
One-Step Mouse Tail DNA Purification Kit, Cat. No. AN101	One-Step Dandruff DNA Purification Kit, Cat. No. AAA101
One-Step Plant DNA Purification Kit, Cat. No. AQ101	Quick mRNA Purification Kit, Cat. No. MMS101
DNA & RNA Sample Preparation	
One-Step NGS Cleanup Kit, Cat. No. AO101	One-Step DNA-RNA Removal Kit, Cat. No. CA103
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One-Step PCR Cleanup Kit, Cat. No. AP101	One-Step Sequencing Cleanup Kit, Cat. No. AI101
Quick Oligo-DNA Conjugation Kit, Cat. No. CA101	One-Step Fluorescent Labeling Cleanup Kit, Cat. No. AK101
One-Step DNA-RNA Removal Kit, Cat. No. AV101	One-Step Single-Stranded DNA Removal Kit, Cat. No. AW101
One-Step PCR Inhibitor Removal Kit, Cat. No. AX101	Pure Miniprep Plasmid DNA Purification Kit, Cat. No. AY101

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