

# QuickExtract™ RNA Extraction Kit

Cat. Nos. QER09015 and QER090150



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## 1. Introduction

The QuickExtract™ RNA Extraction Kit is a fast, simple and inexpensive method for preparing RNA for RT-PCR amplification. The QuickExtract RNA Extraction Kit is a single-tube system that requires only vortex mixing to lyse the cells, and prepare the RNA for cDNA synthesis. This allows easy processing of one to hundreds of samples in minutes, with no sample loss and without the use of toxic organic solvents. The QuickExtract RNA Extraction Solution works with adherent and suspension cells and has been tested on human, mouse, rat, and *E. coli* cell cultures. The RNA extracts have been used successfully for both end-point and real-time RT-PCR. An optional DNase I treatment may improve certain downstream applications.

## 2. Kit Contents

Desc.	Concentration	Quantity
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### QuickExtract™ RNA Extraction Kit Contents

The QuickExtract RNA Extraction Kit is available in two sizes (5 ml and 50 ml), sufficient to perform 50 and 500 standard RNA extractions respectively.

#### QER09015

QuickExtract™ RNA Extraction Solution		5 ml
DNase Buffer 1		550 µl
RNase-Free DNase I	@ 1 MBU/µl	250 µl
Stop Solution		200 µl
RiboGuard™ RNase Inhibitor	@ 40 U/µl	125 µl

#### QER090150

QuickExtract™ RNA Extraction Solution		50 ml
DNase Buffer 1		5.5 ml
RNase-Free DNase I	@ 1 MBU/µl	2.5 ml
Stop Solution		2 ml
RiboGuard™ RNase Inhibitor	@ 40 U/µl	1.25 ml

## 3. Product Specifications

**Storage:** Store the kit at  $-20^{\circ}\text{C}$  in a freezer without a defrost cycle.

**Storage Buffer:** RNase-Free DNase I is supplied in a 50% glycerol solution containing 10 mM Tris-HCl (pH 7.5), 10 mM  $\text{CaCl}_2$ , and 10 mM  $\text{MgCl}_2$ .

**Unit Definition:** One Molecular Biology Unit (MBU) of RNase-Free DNase I converts 1 µg of pUC19 DNA into oligodeoxynucleotides in 10 minutes at  $37^{\circ}\text{C}$ .

**Quality Control:** The QuickExtract RNA Extraction Kit is function-tested by assaying for a PCR product from cDNA produced from RNA extracted from HeLa cells.

**Contaminating Activity Assays:** All components of the QuickExtract RNA Extraction Kit are free of detectable RNase activity, and all of the components except DNase I are free of detectable exo- and endonuclease activities.

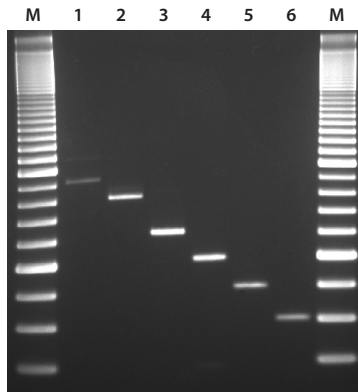
#### 4. Related Products

The following products are also available:

- QuickExtract™ FFPE RNA Extraction Kit
- QuickExtract™ FFPE DNA Extraction Kit
- Catch-All™ Sample Collection Swabs
- MMLV Reverse Transcriptase 1<sup>st</sup>-Strand cDNA Synthesis Kit
- MonsterScript™ 1<sup>st</sup>-Strand cDNA Synthesis Kit
- MMLV High Performance Reverse Transcriptase

#### 5. Notes on Use of the QuickExtract RNA Extraction Kit

1. Perform QuickExtract RNA extractions in an RNase-free work environment.
  - Always wear gloves when handling samples containing RNA and kit components.
  - Do not pick up any kit component with an ungloved hand.
  - Keep all kit components tightly sealed when not in use.
  - Keep all tubes containing RNA tightly sealed during the incubation steps.
2. The extraction protocol is scaleable. The reagent volume can be adjusted according to the number of cells being lysed.



**Figure 1. End-point RT-PCR of different regions of a 14-kb message using HeLa cell extract with the QuickExtract™ RNA Extraction Kit.** 10<sup>5</sup> HeLa cells were lysed in 100 µl of QuickExtract™ RNA Extraction Solution by vortex mixing. 10<sup>5</sup> HeLa cells were lysed in 100 µl of QuickExtract™ RNA Extraction Solution by vortex mixing. One microliter of lysate was reverse transcribed with the MMLV Reverse Transcriptase 1<sup>st</sup>-Strand cDNA Synthesis Kit using standard conditions and random primers. 2 µl of cDNA was then amplified with 6 primer sets to p532 using the FailSafe™ PCR System.

Lanes M: 100-bp ladder;    Lane 1: 12,984-13,892    Lane 2: 9,406-10,202    Lane 3: 5,194-5,802  
                                  Lane 4: 4,191-4,690    Lane 5: 2,280-2,676    Lane 6: 1,029-1,329

3. Catch-All™ Sample Collection Buccal Swabs (Epicentre) can be used to collect cells for RNA extraction. 200 µl of QuickExtract RNA Extraction Solution is needed to cover most of the Catch-All swab head, therefore cells should be collected from both cheeks to maximize the yield and concentration of RNA. Alternatively, cells can be eluted from the swab in 200 µl of PBS, spun down for 5 minutes (see Part A, Step 2), and then resuspended in a smaller volume of QuickExtract RNA Extraction Solution.
4. Lysates should be kept on ice when in use and when possible, used directly in cDNA synthesis reactions. Unused lysates should be stored frozen at -70°C.

## Protocols

### A. Adherent or Suspension Cultured Cells (10<sup>3</sup> to 10<sup>6</sup> cells)

1. Harvest the cells using a method appropriate to the cell type and growth vessel. If trypsin is used for adherent cells harvest, it should be inactivated.
2. Count the cells. Optional: Wash cells with PBS or similar buffer to remove serum and media components.
3. Pellet the cells by centrifugation at 1,000 x g at 4°C for 5 minutes. Aspirate the supernatant.
4. Add 100 µl of ice cold QuickExtract RNA Extraction Solution to the cells and vortex mix for 1 full minute.
5. The RNA can be used directly in a cDNA synthesis reaction or stored frozen at -70°C.
6. The DNA can be removed with an optional DNase I treatment (see Part B).

### B. Optional DNase I Treatment

1. Important! Preheat the lysate at 65°C for 2 minutes in a thermal cycler before proceeding.
2. Add 11 µl of DNase Buffer 1, 2.5 µl of RiboGuard™ RNase Inhibitor, and 5 µl of RNase-free DNase I to the extracted RNA. Mix the sample and incubate the tube at 37°C for 15 minutes.
3. Add 4 µl of Stop Solution to the tube, mix well and incubate at 65°C for 10 minutes.
4. Store the tubes on ice or frozen until the sample is to be used for cDNA synthesis.

### PCR Amplification Recommendations for cDNA and DNA

1. For cDNA synthesis, 1-10 µl of extracted RNA can be used directly with any reverse transcriptase and a standard 20-µl protocol. Up to 50% of the reaction volume can be extracted RNA.
2. For standard and fast end-point PCR cycling profiles, use 1-5 µl of cDNA.
3. When using extracts in real-time RT-PCR with SYBR® Green I Dye, or other similar dye detection, DNase treatment of the extract before cDNA synthesis is recommended. All of the reagents required for DNase I treatment are included in the kit.
4. If possible, design primers so that DNase I treatment is not needed. Primers can be designed to prevent amplification of genomic RNA by choosing sequences that flank a long intron. Short cycling times are then used so that the DNA amplicon

will not be produced while the shorter cDNA amplicon is efficiently produced. Primers can also be chosen that anneal to exon-exon boundaries in the cDNA. These sequences do not exist in the genomic DNA.

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