



# NucleoMag<sup>®</sup> RNA

Automated RNA purification from cells or tissue samples using the IsoPure Mini

## Application benefits

The combination of the proven NucleoMag<sup>®</sup> RNA technology and the IsoPure Mini (16) has several advantages that streamline your RNA purification workflows:

- Verified methods for automated RNA isolation from cells and tissue samples
- Purification of RNA with reliable yield and purity
- Processing of up to 16 samples in parallel
- Simple protocol installation via QR-code scanning or Bluetooth<sup>™</sup> transfer

## Keywords

RNA, cells, animal and human tissue, NucleoMag<sup>®</sup>, magnetic beads, magnetic rod system, IsoPure Mini

## Introduction

Purification of RNA from cells and tissue is the basis for genome-wide transcriptome studies, that can provide an in-depth understanding of gene expression networks and patterns, cross-cancer gene signatures or genetic biomarkers. RNA downstream analyses are placing high demands on the purified nucleic acids in terms of purity and integrity.

To meet these requirements, MACHEREY-NAGEL developed the NucleoMag<sup>®</sup> RNA kit. This magnetic bead-based extraction kit is scalable and was developed for high throughput processing. Purified RNA is of high purity and integrity and meets all the requirements imposed by sophisticated methods such as real-time PCR (RT-qPCR), cDNA synthesis, RNA-Seq or microarray analysis.

In this Application Note we demonstrate the automated RNA purification from cells and tissue using the NucleoMag<sup>®</sup> RNA kit on the IsoPure Mini. The IsoPure Mini is a minimal footprint nucleic acid extraction system adopting magnetic bead technology. Capable of processing up to 16 samples at one time, the stand-alone instrument is easy to set up, program, and operate. Mixing, magnetic bead transfer, washing, and elution steps are performed automatically, saving valuable hands-on time.

An optimized protocol using the IsoPure Mini with the NucleoMag<sup>®</sup> RNA extraction kit can be easily accessed by scanning the QR-code below with the scanner included with the IsoPure Mini device.

NucleoMag <sup>®</sup> RNA	
Technology	Magnetic beads
Sample material	Animal, human and plant tissue and cells
Lysate clarification	Centrifugation
Elution volume	50 – 200 $\mu$ L
Fragment size	> 200 nt
Max. sample number on the IsoPure Mini	16 samples



IsoPure Mini	
Technology	Automated magnetic rod system
Display	4.3 inch-color touch screen
Capacity / volume per well	1 – 16 samples / 50 $\mu$ L to 1000 $\mu$ L
Dimensions	7.9 x 10.2 x 11.8 in. (20 x 26 x 30 cm)
Weight	7.0 kg / 15.4 Lbs
Contamination control	UV lamp (3 W, 253.7 nm UVC wavelength)
Program transfer	Bluetooth <sup>®</sup> , OR scanner, USB flash drive

## Material and Methods

The isolation procedure of the NucleoMag® RNA kit is based on reversible adsorption of nucleic acids to paramagnetic NucleoMag® B-Beads under appropriate buffer conditions. Cells and tissue are lysed in presence of lysis buffer MR1 supplemented with TCEP. Following centrifugation and transfer of supernatant, binding of RNA to the NucleoMag® B-Beads was achieved by the addition of Binding Buffer MR2. Genomic DNA was removed

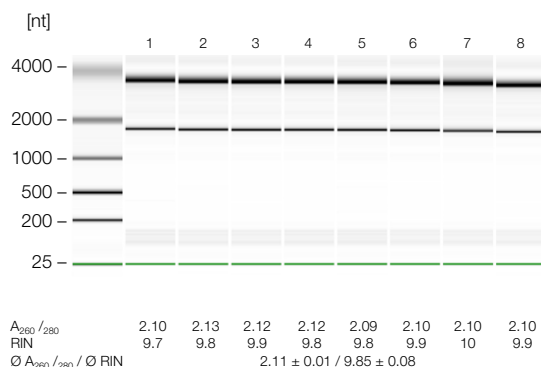
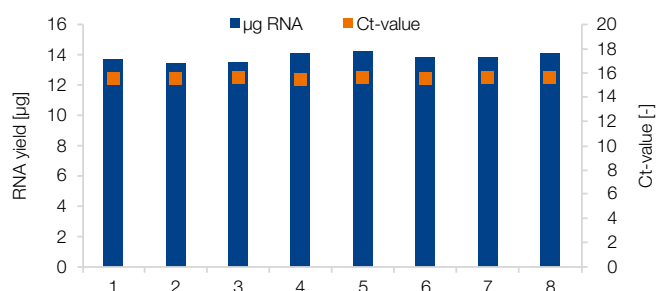
by adding an enzymatic rDNase reaction mixture followed by three subsequent washing steps using Wash Buffers MR3 and MR4 to remove further contaminants and salts. Pure RNA was finally eluted under low ionic strength conditions in slightly alkaline Elution Buffer MR5. All binding, washing, and magnetic bead separation steps were carried out by the IsoPure Mini magnetic rod device.

### Simple method transfer

A handheld scanner is included with each IsoPure Mini device, adding a convenient and fast method for loading a protocol onto the instrument. Simply scan the QR code to instantly transfer the protocol to your IsoPure Mini. For more information regarding loading schemes and set-ups, please download the protocol information from [www.mn-net.com/IsoPureScripts](http://www.mn-net.com/IsoPureScripts).



## Application data



### Reliable reproducibility in automated RNA purification

The figure shows total yields after RNA extraction from eight individual  $5 \times 10^5$  HeLa cell samples. RNA was eluted in a final volume of 100  $\mu\text{L}$ . Total RNA yield was determined by UV spectrometry averaging at  $13.8 \pm 0.3 \mu\text{g}$ . A subsequent qRT-PCR analysis (orange squares) was performed with a Taqman® Probe for a 130 bp Actin amplicon using the SensiFast™ Probe Lo-ROX One step kit from Meridian Bioscience® on an Applied Biosystems® 7500 Real-Time PCR System.

### Quality of isolated RNA from HeLa cells

After total RNA isolated from eight individual  $5 \times 10^5$  HeLa cell samples, the total RNA integrity was determined. RNA was isolated using the NucleoMag® RNA kit on the IsoPure Mini. The quality of the RNA was determined by using the Bioanalyzer® 2100 and the total RNA 6000 Nano kit. The results demonstrate the reliable detection of clear bands for each sample and RIN values constantly above 9.7 with a mean of 9.85 (Standard deviation of  $\pm 0.08$ ). The purity of RNA was determined via UV spectrometry resulting in an average  $A_{260}/_{280}$  of  $2.11 \pm 0.01$ .

## Ordering information

Product	Specifications	Pack of	REF
NucleoMag® RNA	Magnetic bead-based kit for the isolation of RNA from cells and tissue; including NucleoMag® B-Beads, buffers, rDNase	1 $\times$ 96 preps 4 $\times$ 96 preps	744350.1 744350.4
IsoPure Mini	Magnetic rod system for automated nucleic extraction using MACHEREY-NAGEL NucleoMag® kits, parallel processing of up to 16 samples	1	747000
Android tablet with IsoPure Mini app	Android tablet preloaded with IsoPure Mini app for creating or modifying protocols and simple method transfer via Bluetooth®	1	747001
96 Deep-well plates	96 deep-well plates for IsoPure Mini	25	744955
Tip combs	8-place magnetic tip comb for IsoPure Mini	50	744960

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