

# NucleoMag<sup>®</sup> RNA Blood

Versatile automation solution for various blood sample types – Processing on magnetic rod systems

## Application benefits

Access efficient RNA purification from whole blood samples with the NucleoMag<sup>®</sup> RNA Blood Kit. Compatible with EDTA/Citrate blood collection tubes, SARSTEDT S-Monovette<sup>®</sup> RNA Exact, Zymo DNA/RNA Shield<sup>™</sup> Blood Tubes, or Tempus<sup>™</sup> RNA Blood Tubes, this kit offers simplicity and flexibility.

- **Simultaneous processing** of 1 – 96 samples (depends on magnetic rod system)
- **Maximum Versatility:** Utilize the NucleoMag<sup>®</sup> RNA Blood Kit with various blood tube types for maximum flexibility in sample processing.
- **High-Quality RNA:** Experience superior RNA purity, integrity, and yield for reliable downstream applications including RT-PCR and sequencing.
- **Effortless Integration:** Seamlessly integrate magnetic bead-based technology into your automated workflows, enhancing efficiency without compromising quality.

## Keywords

RNA, extraction, purification, blood, whole blood, EDTA, Citrate, transcriptomics, biomarker, S-Monovette<sup>®</sup> RNA Exact, DNA/RNA Shield<sup>™</sup> Blood Tubes, Tempus<sup>™</sup> RNA Blood Tubes, automation, liquid handling, magnetic rod systems, KingFisher<sup>™</sup>, MagnetaPure 32 Plus, IsoPure<sup>™</sup> Mini

## Introduction

Effective RNA stabilization in blood samples is vital for various applications in diagnostics, therapeutics, and biomedical research, as RNA molecules offer crucial insights into gene expression and biological processes. However, the inherent fragility of RNA poses challenges in maintaining its integrity, especially in the presence of endogenous RNases and destabilizing factors. Addressing this challenge, the NucleoMag<sup>®</sup> RNA Blood Kit emerges as a solution tailored for the purification of RNA from stabilized blood samples. This innovative product facilitates the extraction of high-quality human RNA, primed for downstream analyses such as RT-PCR, qRT-PCR, or RNA-Seq. Notably, the kit is compatible with multiple blood tube types, including EDTA/Citrate blood collection tubes, S-Monovette<sup>®</sup> RNA Exact, DNA/RNA Shield<sup>™</sup> Blood Tubes, and Tempus<sup>™</sup> RNA Blood Tubes, ensuring maximum flexibility across laboratory settings. With seamless integration into automated workflows, minimal hands-on requirements, and convenient room temperature processing, this kit streamlines RNA purification, promising efficiency and reliability. In this application note, we explore the purification process using magnetic rod systems, demonstrating the kit's versatility while extending support for automation on various platforms, including the MagnetaPure 32 Plus, the IsoPure<sup>™</sup> Mini, and other automation devices.

### NucleoMag<sup>®</sup> RNA Blood

Technology	Magnetic beads
Processing	Manual or automated
Sample material	Whole blood
Compatibility	<ul style="list-style-type: none"> <li>▪ SARSTEDT<sup>®</sup> S-Monovette RNA Exact</li> <li>▪ Zymo RNA/DNA Shield<sup>™</sup> Blood Tubes</li> <li>▪ Tempus<sup>™</sup> RNA Blood Tubes*</li> <li>▪ EDTA/Citrate blood collection tubes*</li> </ul>
Elution volume	50 – 100 µL
Purification time	Approx. 90 min*

\*The Tempus<sup>™</sup> RNA Blood tubes require additional up-front handling and RNA pelleting at 4 °C. Additional buffers must be ordered separately.

### Magnetic rod systems

Technology	Automated magnetic rod system
Sample Capacity	Depending on the device, accommodates varying sample volumes, and numbers (e. g. 1 – 96, MagnetaPure 32 Plus: 32 samples, IsoPure <sup>™</sup> Mini: 16 samples)
Format	Available in different device formats, e. g. IsoPure <sup>™</sup> Mini (16 samples) or MagnetaPure 32 Plus (32 Plus)*
Automation support	<p>MACHEREY-NAGEL provides free verified scripts for most open magnetic rod systems</p> <p>Please contact us for personal assistance: Phone: +49 2421 969 333 Email: support@mn-net.com</p>

\*For ordering or inquiries regarding the MagnetaPure 32 Plus or IsoPure<sup>™</sup> Mini device, please contact a representative of MACHEREY-NAGEL. Visit [www.mn-net.com](http://www.mn-net.com) for more detailed product information.

## Material and Methods

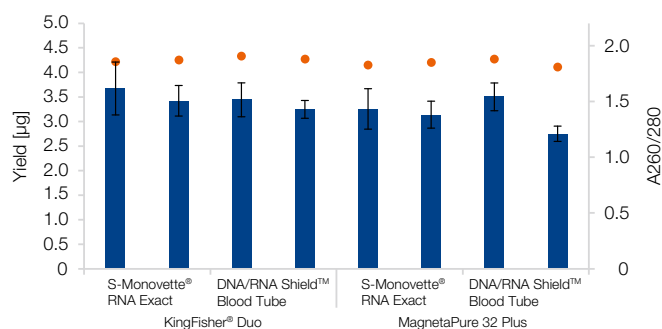
Blood samples were collected and preserved using either the SARSTEDT S-Monovette® RNA Exact or the Zymo DNA/RNA Shield™ Blood Tube. Subsequent extraction of the samples followed the protocol provided with the NucleoMag® RNA Blood kit. This involved digestion with proteinase K and reversible binding of nucleic acids to paramagnetic NucleoMag® B-beads using Binding Buffer MBR1. Magnetic separation was conducted, followed by two washing steps to ensure purity. Co-purified DNA was removed by incubating the beads with recombinant DNase. After RNA re-binding, residual contaminants and salts were

removed with an additional wash step, and residual ethanol was evaporated. Highly pure RNA was eluted with RNase-Free H<sub>2</sub>O, ready for downstream applications.

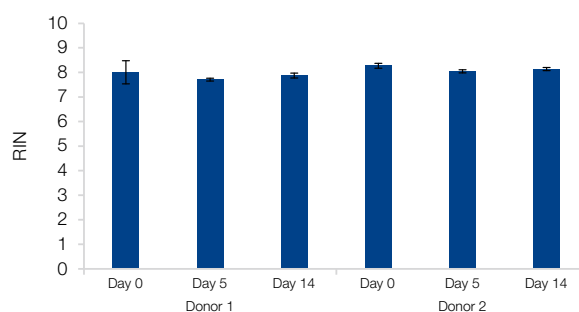
All binding, washing, and magnetic bead separation steps were performed using either the MagnetaPure 32 Plus magnetic rod device or the Thermo Fisher Scientific KingFisher® DUO instrument. Scripts and methods for these instruments are freely available from MACHEREY-NAGEL. The presented method serves as an exemplary workflow for these instruments. For script support, assistance or inquiries, please don't hesitate to contact us.

## Application Data

A



B



### Comparative analysis of RNA yield and purity from SARSTEDT S-Monovette® RNA Exact and Zymo DNA/RNA Shield™ Blood Tubes

Blood specimens sourced from two distinct donors were collected using SARSTEDT S-Monovette® RNA Exact or Zymo DNA/RNA Shield™ Blood Tubes, followed by purification employing the NucleoMag® RNA Blood Kit via automated protocols on the MagnetaPure 32 Plus or KingFisher Duo platform (n= 3 per tube and instrument). Purified RNA underwent UV spectrometry analysis to assess total yield (blue bars) and purity (A260/280, orange dots). The data underscore remarkable reproducibility in RNA yield and purity across different donors, blood collection tubes, and automation platforms.

### Robust RNA integrity profiles in S-Monovette® RNA Exact-collected samples

Blood specimens were procured from two distinct donors utilizing SARSTEDT S-Monovette® RNA Exact tubes and were subjected to purification employing the NucleoMag® RNA Blood kit via the automated MagnetaPure 32 Plus magnetic rod platform. Processing occurred subsequent to storage at room temperature for 2 hours (Day 0), 5 days (Day 5), or after two weeks of refrigeration at 2–8 °C (Day 14). Analysis conducted utilizing the Agilent Pico-Chip revealed excellent RNA integrity ( $8.0 \pm 0.19$ ), persisting across all examined time points and donors (n= 3 per donor and time point).



## Ordering information

Product	Specifications	Quantity	REF
NucleoMag® RNA Blood	Magnetic bead-based kit for the purification of RNA from whole blood samples collected in SARSTEDT S-Monovette® RNA Exact, Zymo DNA/RNA Shield™ Blood Tubes, or Tempus™ RNA Blood Tubes. The kit includes NucleoMag® B-Beads, Buffers, Liquid Proteinase K, and RNase-free rDNase.	1 × 96 preps	744352.1
		4 × 96 preps	744352.4
Buffer DL RNase-free water	Lysis buffer and RNase-free water are needed to process Tempus™ RNA Blood Tubes using the NucleoMag® RNA Blood kit.	100 mL	740202.32
		1000 mL	740378.1000
Buffer DL Wash Buffer RAW	Lysis buffer and Wash Buffer RAW are needed to process EDTA/Citrate blood tubes using the NucleoMag® RNA Blood kit.	100 mL	740202.32
		150 mL	740361.150

For ordering or inquiries regarding the MagnetaPure 32 Plus or IsoPure™ Mini device, please contact a representative of MACHEREY-NAGEL.

Blood tubes are not provided with the NucleoMag® RNA Blood kit and must be purchased separately. The trademarks mentioned herein are the property of their respective owners. NucleoMag® is a registered trademark of MACHEREY-NAGEL. Tempus™ is a registered trademark of Life Technologies. DNA/RNA Shield™ is a registered trademark of Zymo Research Corporation. Monovette® is a registered trademark of SARSTEDT. KingFisher® is a registered trademark of Thermo Scientific Inc.