Magnetic Total RNA Extraction Kit

Cat. No.: M1521678 | Pack size: 48T | Storage: 2-8°C protected from light; room temperature

Overview

This kit is designed for the rapid isolation of RNA from various sample types, including animal tissues, cells, plants, bacteria, and fungi. It provides a simple and rapid solution for total RNA extraction from biological samples such as animal tissues and cells. The kit is based on superparamagnetic particle purification technology, eliminating the need for time-consuming alcohol precipitation. The resulting RNA can be used directly in downstream applications such as RT-PCR, Northern Blot, Poly A purification, nuclease protection assays, and in vitro translation. The processed products are intended for scientific research and testing purposes only.

Kit Contents & Storage

Cat. No.	Component	48T	Storage
M1521678A	Total RNA Extraction Reagent	55 mL	2-8°C. Store in the dark.
M1521678B	Phase Separation Buffer SF	11 mL	2-8°C. Store in the dark.
M1521678C	Magnetic Beads MXVB	1.1 mL	2-8°C.
M1521678D	Wash Buffer DW1	40 mL	RT.
M1521678E	Wash Buffer DW2	80 mL	RT.
M1521678F	Elution Buffer RE	6 mL	RT.

Each component has a shelf life of 12 months under corresponding storage conditions.

Storage Conditions

M1521678A, M1521678B: Store at 2–8°C protected from light, stable for 12 months.

M1521678C: Store at 2–8°C, stable for 12 months.

M1521678D, M1521678E, M1521678F: Store at room temperature, stable for 12 months.

Compatible Instruments

Manual extraction.

Precautions

Read this manual carefully before use.

Several buffers in this kit contain irritating guanidinium salts. Always wear gloves and handle according to standard safety precautions. Avoid contact of buffers with skin, eyes, and mucous membranes. In case of contact, flush immediately with plenty of water and seek medical attention.

If precipitation occurs in the solution due to low ambient temperatures, incubate at 30°C in a water bath until the precipitate is completely dissolved before use.

If the magnetic beads cannot be resuspended after vigorous shaking due to low ambient temperatures, do not use the beads.

Several buffers in this kit contain guanidinium salts. Do not treat with oxidizing disinfectants such as sodium hypochlorite, as this may release toxic gases. Dispose of waste according to medical waste regulations.

This kit components are designed to be used together as a system. Components from different lot numbers should not be interchanged or mixed.

Instructions for Use

1. Sample Requirements

Applicable sample types: Animal tissues, cells, plants, bacteria, fungi, and similar samples.

Sample storage and transport: Samples may be processed immediately or stored at -70°C or lower for up to 6 months. Avoid repeated freeze-thaw cycles. Transport samples using cold chain logistics.

Freeze-thaw requirements: Rapid freezing and rapid thawing are recommended; avoid repeated freeze-thaw cycles.

2. Equipment and Reagents to be Supplied by User

Constant temperature water bath (for use when precipitation occurs in solutions);

Tissue homogenizer;

2 mL homogenization tubes;

Magnetic separation rack (for 1.5/2.0 mL tubes);

1.5/2.0 mL sterile, nuclease-free centrifuge tubes;

Pipettes and tips of various volumes (20, 200, 1000 µL);

Absolute ethanol.

3. Reagent Preparation

Check solutions for any precipitation and confirm that the magnetic beads can be resuspended.

4. Operating Procedure

Recommendation for magnetic separation (starting from step 4.6): After placing the centrifuge tube on the magnetic rack, gently rotate it left and right. Once the magnetic beads have aggregated against the tube wall closest to the magnet, gently invert the entire rack several times to collect any beads from the cap onto the tube wall. Allow to stand for several minutes until the solution becomes clear (standing time depends on the strength of the magnetic rack).

4.1 Select the appropriate procedure based on sample type:

(1) Tissue

Weigh approximately 20 mg of animal tissue sample into a 1.5 mL centrifuge tube. Add 1 mL of Total RNA Extraction Reagent and homogenize using a tissue homogenizer. Let stand at room temperature for 5 minutes to ensure complete lysis.

Alternatively, grind an appropriate amount of animal tissue sample thoroughly using liquid nitrogen. Weigh approximately 20 mg of the ground powder into a 1.5 mL centrifuge tube. Add 1 mL of Total RNA Extraction Reagent, vortex to disperse the sample, and let stand at room temperature for 5 minutes to ensure complete lysis.

(2) Cells

Adherent cultured cells: For ≤ 5×10^6 cultured cells, completely aspirate the culture medium. Add 1 mL of Total RNA Extraction Reagent and pipette up and down 3–5 times to digest the cells. Transfer the entire lysate to a 1.5 mL centrifuge tube and let stand at room temperature for 5 minutes to ensure complete lysis.

Suspension cells: Centrifuge at 500 × g for 5 minutes to collect the cells (≤ 5×10^6 cells). Completely remove the culture medium. Vortex or flick the tube to disperse the cell pellet. Add 1 mL of Total RNA Extraction Reagent and pipette up and down 3–5 times for digestion and lysis. Let stand at room temperature for 5 minutes to ensure complete lysis.

(3) Plant

Grind the plant sample into a fine powder using liquid nitrogen. Weigh 50–100 mg of the sample powder into a 1.5 mL centrifuge tube. Immediately add 1 mL of Total RNA Extraction Reagent and vortex to disperse the sample. Let stand at room temperature for 5 minutes to ensure complete lysis.

(4) Bacteria

Collect bacteria by centrifugation (1×10^8 cells). Add 100 µL of TE buffer containing lysozyme (user-supplied) and incubate for 10 minutes. Then, add 1 mL of Total RNA Extraction Reagent and vortex for 1 minute.

(5) Micro-fungi

Transfer 10–20 mg of fungal sample to a 2 mL homogenization tube. Add 1 mL of Total RNA Extraction Reagent and vortex at high speed for 5–10 minutes to ensure complete lysis.

4.2 (Optional) Centrifuge at 12,000 × g for 10 minutes at 4°C, then transfer all of the supernatant to a new centrifuge tube.

Note: *When processing samples rich in protein or difficult-to-lyse tissues, undissolved material may remain after homogenization. Centrifugation to remove this debris helps improve purity. For lipid-rich samples, a layer of lipid may appear on the surface of the solution after centrifugation; avoid aspirating this lipid layer when transferring the supernatant.*

4.3 Add 200 µL of Phase Separation Buffer SF or chloroform. Shake vigorously by hand for 15 seconds (do not use a vortex mixer). Let stand at room temperature for 3–5 minutes.

Note: *Using a vortex mixer instead of manual shaking may result in increased genomic DNA contamination. Shaking must be vigorous; gentle inversion will lead to insufficient phase separation. Phase Separation Buffer SF is a chloroform substitute and must be added in the specified ratio. Excessive amounts of SF may cause DNA and protein to re-enter the aqueous phase, reducing RNA purity. If chloroform is available, it may be used for this step instead.*

4.4 Centrifuge at 12,000 × g for 15 minutes at 4°C.

Note: *After centrifugation, a three-phase system will form. The upper aqueous phase contains RNA, while DNA and proteins are located in the interphase and the lower organic phase. The thickness of the interphase varies depending on the sample type and may be minimal for some samples.*

4.5 Carefully aspirate the upper aqueous phase and transfer it to a new centrifuge tube. Add an equal volume of absolute ethanol and 20 µL of Magnetic Beads MXVB. Shake or vortex for 10 minutes to allow RNA binding to the beads.

4.6 Place the tube on the magnetic rack for magnetic separation until the solution is clear, then aspirate and discard the supernatant.

4.7 Add 700 µL of Wash Buffer DW1. Vortex for 30 seconds, then place on the magnetic rack for separation until the solution is clear. Aspirate and discard the supernatant.

4.8 Add 700 µL of Wash Buffer DW2. Vortex for 30 seconds, then place on the magnetic rack for separation until the solution is clear. Aspirate and discard the supernatant.

4.9 Add another 700 µL of Wash Buffer DW2. Vortex for 30 seconds, then place on the magnetic rack for separation until the solution is clear. Aspirate and discard the supernatant.

4.10 Perform a quick spin using a mini centrifuge, then place the tube back on the magnetic rack and allow beads to collect until the solution is clear. Carefully aspirate and discard all residual liquid. Open the tube cap and air-dry the beads for 3–5 minutes.

Note: *Residual ethanol will inhibit downstream enzymatic reactions. Ensure ethanol has completely evaporated during drying. Do not over-dry the beads, as this may affect subsequent elution efficiency.*

4.11 Add 50–100 µL of Elution Buffer RE and vortex at high speed for 2–3 minutes to fully disperse the beads.

4.12 Briefly centrifuge to collect any droplets from the cap into the tube, then place on the magnetic rack for magnetic separation.

4.13 Transfer the extracted RNA solution to a new 1.5 mL sterile, nuclease-free centrifuge tube. If not used immediately, store at -15 to -25°C. For long-term storage, place at -70°C or lower.

Limitations of the Method

For certain poorly collected samples, trace impurities in the extracted product may inhibit PCR amplification.

The efficiency of nucleic acid extraction is closely related to the quality of sample collection, handling, transport, and storage. Any error in these processes may lead to inaccurate results.

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Limitations & Disclaimer

- For Research Use Only (RUO). Not for use in human or animal diagnostics, therapeutics, or in vivo applications. Not for food, cosmetic, or household use.

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