

Magnetic Pathogen DNA/RNA Kit

Cat. No.: M1522636 | Pack size: 48T | Storage: Store at 2-8°C, Room temperature

Overview

This kit is suitable for the extraction of pathogenic microbial nucleic acids from samples such as cervical swab preservation solution, whole blood, plasma, sputum, bronchoalveolar lavage fluid, and cerebrospinal fluid. The method employs magnetic bead purification technology, eliminating the need for toxic phenol-chloroform extraction or time-consuming alcohol precipitation. Nucleic acids purified with this method include total microbial nucleic acids from viruses, mycoplasma, bacteria, fungi, and other microorganisms. The resulting products can be used directly in PCR, qPCR, next-generation sequencing, and other experiments. The purified nucleic acids are intended for research use only.

Kit Contents & Storage

Product Code	Component	Appearance	48T	Storage
M1522636A	Proteinase K	Liquid	1.1 mL	2-8 °C
M1522636B	Nucleic Acid Preservation Solution MP	Liquid	12 mL	RT
M1522636C	Grinding Tube (ZB_M1)	-	1 EA × 48	RT
M1522636D	Antifoam Agent	Liquid	200 µL	RT
M1522636E	Lysis/Binding Buffer RLC	Liquid	33 mL	RT
M1522636F	Magnetic Beads MXVB	Liquid	1.1 mL	2-8 °C
M1522636G	Wash Buffer PW1	Liquid	40 mL	RT
M1522636H	Wash Buffer DW2	Liquid	80 mL	RT
M1522636I	Elution Buffer DE	Liquid	6 mL	RT

Storage Conditions

M1522636A, M1522636F: Store at 2-8 °C for 12 months.

M1522636B, M1522636C, M1522636D, M1522636E, M1522636G, M1522636H, M1522636I: Store at room temperature for 12 months.

Compatible Instrumentation

Manual extraction.

Precautions

Read the entire manual carefully before use.

Several buffers contain irritating guanidine salts. Always wear gloves and follow standard safety precautions. Avoid contact with skin, eyes, and mucous membranes. If contact occurs, rinse immediately with plenty of water and seek medical attention.

If precipitates appear due to low temperature, warm the solution at 30 °C until precipitates are completely dissolved before use.

If magnetic beads cannot be resuspended by vigorous shaking due to low temperature, do not use.

Several buffers contain guanidine salts. Do not treat with oxidizing disinfectants (e.g., sodium hypochlorite) as this may release toxic gas. Dispose as medical waste.

This kit is intended for use as an integrated system. Do not interchange or mix components from different lot numbers.

Protocol

1. Sample Requirements

Applicable sample types: Cervical swabs, whole blood, plasma, sputum, bronchoalveolar lavage fluid, cerebrospinal fluid, and other samples.

Sample preservation and transport: Samples can be processed immediately or stored at -70 °C or lower for up to 6 months. Avoid repeated freeze-thaw cycles. Transport samples under cold chain conditions.

Freeze-thaw requirements: Quick freeze and quick thaw; avoid repeated freeze-thaw cycles.

2. Materials to Be Prepared by User

Water bath (for dissolving precipitates), dry thermostat bath

Magnetic stand

1.5/2.0 mL sterile, nuclease-free centrifuge tubes

Various pipettes and tips (20 µL, 200 µL, 1000 µL)

3. Reagent Preparation

Check solutions for precipitates and ensure magnetic beads can be resuspended.

Before using this kit for the first time, add 20 µL of Antifoam Agent to the Nucleic Acid Preservation Solution MP and mix by inversion.

4. Procedure

4.1 Sample processing according to sample type

Sputum samples: Transfer an appropriate amount of sputum to a 2 mL centrifuge tube. Add 20-100 µL of 1 M DTT (prepare by user; adjust amount according to sample viscosity). Incubate at 70 °C until fully liquefied. Transfer 400 µL to a Grinding Tube (ZB_M1). Alternatively, reduce the sample volume and dilute with physiological saline, then transfer 400 µL to a Grinding Tube (ZB_M1). Add 200 µL of Nucleic Acid Preservation Solution MP and 20 µL of Proteinase K. Vortex at maximum speed or transfer to a bead beater and grind at high speed for 10 minutes (follow the instrument-recommended program for different brands).

Swab samples or other biological fluid samples containing preservation solution (guanidine salt >1 M): Transfer 400 µL of liquid sample to a Grinding Tube (ZB_M1), then add 20 µL of Proteinase K. Vortex at maximum speed or transfer to a bead beater and grind at high speed for 10 minutes (follow the instrument-recommended program). Note: If the sample volume is less than 400 µL, make up to 400 µL with Nucleic Acid Preservation Solution MP.

Whole blood samples: Transfer 400 µL of liquid sample to a Grinding Tube (ZB_M1). Add 200 µL of Nucleic Acid Preservation Solution MP and 20 µL of Proteinase K. Vortex at maximum speed or transfer to a bead beater and grind at high speed for 10 minutes (follow the instrument-recommended program). Notes:

For whole blood samples with high cell content (e.g., cord blood, bone marrow blood), magnetic bead or color residue may occur during extraction. It is recommended to dilute the sample with physiological saline or PBS before nucleic acid extraction.

For sputum samples, magnetic bead residue may occur. It is recommended to dilute the sample with physiological saline or PBS before nucleic acid extraction.

4.2 Briefly centrifuge. Transfer 300 µL of the supernatant to a new centrifuge tube containing 600 µL of Lysis/Binding Buffer RLC. Carefully pipette to avoid transferring precipitate or glass beads.

4.3 Add 20 µL of Magnetic Beads MXVB. Vortex for 30 seconds to mix, then shake or vortex for 5-7 minutes to allow the beads to bind nucleic acids.

4.4 Place the tube on a magnetic stand for magnetic separation until the solution is clear. Aspirate and discard the supernatant.

4.5 Add 700 µL of Wash Buffer PW1. Vortex for 60-180 seconds, then return to the magnetic stand and allow the solution to become clear. Aspirate and discard the supernatant.

4.6 Add 700 μL of Wash Buffer DW2. Vortex for 30 seconds to resuspend the beads. Return to the magnetic stand, separate until clear, and aspirate the supernatant.

4.7 Add another 700 μL of Wash Buffer DW2. Vortex for 30 seconds to resuspend the beads. Separate magnetically until clear, then aspirate the supernatant.

4.8 Briefly centrifuge in a microcentrifuge. Place the tube on the magnetic stand and allow the solution to become clear. Aspirate and discard all remaining liquid thoroughly. Open the cap and air-dry for 3-5 minutes.

Note: Residual ethanol will inhibit downstream enzymatic reactions. Ensure that ethanol is completely evaporated during drying. Do not over-dry, as this may affect elution efficiency.

4.9 Add 30-100 μL of Elution Buffer DE. Vortex vigorously for 2-3 minutes to fully resuspend the beads.

4.10 Incubate at 60 $^{\circ}\text{C}$ with shaking for 5 minutes. If the incubator does not have a shaking function, remove the tube during incubation and vortex vigorously to resuspend the beads 2-3 times, each for 10-30 seconds.

4.11 Briefly centrifuge to collect droplets from the cap. Return the tube to the magnetic stand for magnetic separation.

4.12 Transfer the nucleic acid solution to a new centrifuge tube for immediate use. If not used immediately, store at -15 to -25 $^{\circ}\text{C}$. For long-term storage, keep at -70 $^{\circ}\text{C}$ or lower.

Note: Before performing downstream PCR or qPCR, for double-stranded RNA viruses (e.g., rotavirus, infectious pancreatic necrosis virus, infectious bursal disease virus, Drosophila X virus, Tellina virus (TV) of bivalve mollusks, and oyster virus (OV)), it is recommended to denature the double-stranded RNA at 90 $^{\circ}\text{C}$ for 5 minutes, then rapidly cool to 4 $^{\circ}\text{C}$ before reverse transcription and subsequent PCR.

Limitations of the Method

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

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

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Aladdin Scientific Corporation

14078 Meridian Parkway, Riverside, CA 92518, USA

Phone: 1-833-552-7181

Sales: sales@aladdinsci.com

Customer Service: custserv@aladdinsci.com

Aladdin Biochem Deutschland GmbH

Westring 2, 33142 Büren, Germany

Phone: +02951 9383958

Support: support.eu@aladdinsci.com

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.
- This product is not a CE-marked in vitro diagnostic device under IVDR (EU) 2017/746 and is not an FDA-cleared device under 21 CFR. Use is restricted to verified businesses, institutions, and qualified professionals for research and development purposes.
- Where any kit component is classified as hazardous under CLP (EC) 1272/2008 or OSHA HCS (29 CFR 1910.1200), the product Safety Data Sheet (SDS) takes precedence over this document for handling, storage, and disposal information.
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