Magnetic Micro Sample DNA Kit

Cat. No.: M1522612 | Pack size: 48T | Storage: Store at 2-8℃, Room temperature

Overview

This kit provides a simple and rapid solution for genomic DNA extraction from trace samples. The method employs superparamagnetic bead purification technology, eliminating the need for toxic phenol-chloroform extraction. The procedure is straightforward and convenient, and the purified DNA can be used directly as a template for PCR, restriction enzyme digestion, hybridization, and other molecular biology experiments. The purified DNA is intended for research use only.

Kit Contents & Storage

Product Code	Component	Appearance	48T	Storage
M1522612A	Lysis Buffer AL	Liquid	70 mL	RT
M1522612B	Lysis Buffer ML	Liquid	14 mL	RT
M1522612C	Proteinase K	Liquid	1.1 mL	2-8 ℃
M1522612D	Lysis/Binding Buffer RLB	Liquid	35 mL	RT
M1522612E	Magnetic Beads MXVB	Liquid	1.1 mL	2-8 ℃
M1522612F	Wash Buffer MW1	Liquid	40 mL	RT
M1522612G	Wash Buffer BW1	Liquid	40 mL	RT
M1522612H	Wash Buffer DW2	Liquid	40 mL	RT
M1522612I	Elution Buffer DE	Liquid	5 mL	RT

Storage Conditions

M1522612C, M1522612E: Store at 2-8 ℃ for 12 months.

M1522612A, M1522612B, M1522612D, M1522612F, M1522612G, M1522612H, M1522612I: 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 ℃ until precipitates are completely dissolved before use.

If precipitates appear in Lysis Buffer AL or Lysis Buffer ML due to low temperature, warm at 60 ℃ until 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: Trace blood, trace tissue, bone marrow, dried blood spots, saliva stains, mouthwash, chewing gum, toothbrushes, cigarette butts, fingernails, hair, shrimp shells, and other trace samples.

Sample preservation and transport: Samples can be processed immediately or stored at -70 ℃ 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 (for 1.5/2.0 mL tubes)

1.5/2.0/50.0 mL sterile, nuclease-free centrifuge tubes

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

1 M DTT (for fingernails, hair, bone marrow, shrimp shells)

3. Reagent Preparation

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

4. Procedure

Recommended magnetic separation procedure (starting from step 4.5): Place the tube on the magnetic stand, gently rotate left and right until the beads aggregate on the tube wall closest to the magnet. Gently invert the magnetic stand several times to collect beads from the cap onto the wall. Let stand for several minutes until the solution is clear (stand time depends on the magnet strength).

4.1 Sample processing according to sample type

Trace blood: Transfer 1-100 µL of blood to a 1.5 mL centrifuge tube. Add 200 µL of Lysis Buffer ML and 20 µL of Proteinase K. Vortex to mix. Incubate at 56 ℃ for 10 minutes, vortexing for 15 seconds every 3 minutes during incubation.

Trace tissue: Transfer up to 10 mg of tissue to a 1.5 mL centrifuge tube. Add 200 µL of Lysis Buffer AL and 20 µL of Proteinase K. Vortex to mix. Incubate at 56 ℃ until the sample is fully digested (approximately 40 minutes to 1 hour). A homogenizer may be used to aid tissue digestion. Vortex for 15 seconds every 10 minutes during incubation.

Bone marrow: Transfer up to 10 mg of bone marrow to a 1.5 mL centrifuge tube. Add 200 µL of Lysis Buffer AL, 20 µL of Proteinase K, and 20 µL of 1 M DTT. Vortex to mix. Incubate at 56 ℃ until fully digested (approximately 40 minutes to 1 hour). A homogenizer may be used. Vortex for 15 seconds every 10 minutes during incubation.

Dried blood spot: Cut one dried blood spot into small pieces and transfer to a 1.5 mL centrifuge tube. Add 300 µL of Lysis Buffer AL and 20 µL of Proteinase K. Vortex to mix. Incubate at 56-75 ℃ for 40 minutes, vortexing for 15 seconds every 10 minutes.

Saliva stain: Cut one saliva stain into small pieces and transfer to a 1.5 mL centrifuge tube. Add 300 µL of Lysis Buffer AL and 20 µL of Proteinase K. Vortex to mix. Incubate at 56 ℃ for 40 minutes, vortexing for 15 seconds every 10 minutes.

Mouthwash: Transfer 10-20 mL of mouthwash to a 50 mL centrifuge tube. Centrifuge at 1800×g for 5 minutes. Carefully discard the supernatant. Resuspend the pellet in 200 µL of Lysis Buffer ML and transfer the entire suspension to a 1.5 mL centrifuge tube. Add 20 µL of Proteinase K, vortex to mix, and incubate at 56 ℃ for 40 minutes, vortexing for 15 seconds every 10 minutes.

Chewing gum: Take approximately 0.4 g of chewed gum, cut into small pieces, and transfer to a 2.0 mL centrifuge tube. Add 500 µL of Lysis Buffer AL and 20 µL of Proteinase K. Vortex to mix. Incubate at 56 ℃ for 40 minutes, vortexing for 15 seconds every 10 minutes. (Note: Ensure the gum is submerged as much as possible in Lysis Buffer AL.)

Toothbrush: Cut or snip toothbrush bristles into a 2.0 mL centrifuge tube. Add 500-700 µL of Lysis Buffer AL and 20 µL of Proteinase K. Vortex to mix. Incubate at 56 ℃ for 40 minutes, vortexing for 15 seconds every 10 minutes. (Note: Submerge bristles as much as possible; use 700 µL for dry brushes, 500 µL for wet bristles.)

Cigarette butt: Place one cigarette butt into a 2.0 mL centrifuge tube. Add 1000-1200 µL of Lysis Buffer AL and 20 µL of Proteinase K. Vortex to mix. Incubate at 56 ℃ for 40 minutes to 1 hour, vortexing for 15 seconds every 10 minutes. (Note: Ensure the butt is thoroughly wetted by the lysis buffer.)

Fingernail: Cut 5 mg of fingernail into small pieces and transfer to a 1.5 mL centrifuge tube. Add 250 µL of Lysis Buffer ML, 20 µL of Proteinase K, and 20 µL of 1 M DTT. Vortex to mix. Incubate at 56 ℃ for 1 hour, vortexing for 15 seconds every 10 minutes.

Unstained hair: Transfer 10 mg of hair (1 cm pieces) to a 1.5 mL centrifuge tube. Add 250 µL of Lysis Buffer ML, 20 µL of Proteinase K, and 20 µL of 1 M DTT. Vortex to mix. Incubate at 56 ℃ for 1 hour (digestion time can be extended until hair is fully digested), vortexing for 30 seconds every 15 minutes.

Stained hair (requires separate purchase of our Precipitation Solution SPS; follow the procedure below): Transfer 10 mg of stained hair (1 cm pieces) to a 1.5 mL centrifuge tube. Add 200 µL of Lysis Buffer ML, 20 µL of Proteinase K, and 20 µL of 1 M DTT. Vortex to mix. Incubate at 56 ℃ with shaking for 1 hour (if the incubator lacks a shaking function, vortex for 30 seconds every 15 minutes to promote lysis). Add 200 µL of Precipitation Solution SPS, mix well, then chill on ice for 10 minutes. Centrifuge at 10,000×g for 3 minutes.

Shrimp shell: Cut 10 mg of shrimp shell into small pieces and transfer to a 1.5 mL centrifuge tube. Add 250 µL of Lysis Buffer AL, 20 µL of Proteinase K, and 20 µL of 1 M DTT. Vortex to mix. Incubate at 56 ℃ for 1 hour, vortexing for 15 seconds every 10 minutes.

4.2 After digestion, briefly centrifuge to collect liquid from the walls and cap.

4.3 Transfer the digested lysate to a new 1.5 mL centrifuge tube. The volume to transfer varies by sample type:

Trace blood: entire lysate

Trace tissue: entire lysate

Bone marrow: entire lysate

Dried blood spot: entire lysate

Saliva stain: entire lysate

Mouthwash: entire lysate

Chewing gum: 300 µL lysate, avoid taking any gum pieces

Toothbrush: 300 µL lysate, avoid taking bristles

Cigarette butt: 300 µL lysate

Fingernail: entire lysate

Unstained hair: entire lysate

Stained hair: 200-300 µL supernatant

Shrimp shell: entire lysate

4.4 Add 600 µL of Lysis/Binding Buffer RLB and 20 µL of Magnetic Beads MXVB. Shake or vortex for 5-7 minutes to allow the beads to bind DNA.

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

4.6 Add 700 µL of Wash Buffer MW1. Vortex for 10 seconds, then separate magnetically until clear. Aspirate and discard the supernatant.

4.7 Add 700 µL of Wash Buffer BW1. Vortex for 10 seconds, then separate magnetically until clear. Aspirate and discard the supernatant.

4.8 Add 700 µL of Wash Buffer DW2. Vortex for 10 seconds, then separate magnetically until clear. Aspirate and discard the supernatant.

4.9 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.

4.10 Add 30-50 µL of Elution Buffer DE. Vortex vigorously for 2-3 minutes to fully resuspend the beads.

4.11 Incubate at 60 ℃ for 5 minutes, then vortex vigorously for 30 seconds.

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

4.13 Transfer the supernatant genomic DNA to a new centrifuge tube for immediate use. If not used immediately, store at -15 to -25 ℃. For long-term storage, keep at -70 ℃ or lower.

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.

Contact & Global Offices

Whether you have a technical question, need help with a quotation, or want to inquire about an order, our regional teams are ready to assist. Please contact the office for your region; for general inquiries, the North American office is the corporate primary.

NORTH AMERICAN SALES, SUPPORT & GENERAL INQUIRIES

Aladdin Scientific Corporation

14078 Meridian Parkway, Riverside, CA 92518, USA

Phone: 1-833-552-7181

Sales: sales@aladdinsci.com

Customer Service: custserv@aladdinsci.com

EU SALES, LOGISTICS & LOCALIZED SUPPORT

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.
- Performance depends on sample type, sample condition, handling, and operator technique. Users are responsible for validating the kit for their specific application.
- Aladdin product labels, SDS, COA, and approved specifications take precedence over this document. If product formulation, label, SDS, storage conditions, pack size, or quality specifications change, this document would be reviewed and reissued.