Magnetic Universal DNA Kit

Cat.No.: HYC272

Product Description

This kit delivers a simple and rapid solution for DNA purification from biological specimens including dried blood spots, swabs, anticoagulated whole blood, serum, plasma, saliva, cultured cells, trace tissue and paraffin-embedded sections. DNA isolated via this method covers genomic DNA, mitochondrial DNA, viral DNA (e.g., Hepatitis B virus DNA), as well as DNA from other parasitic microorganisms. Purified DNA can be directly applied to PCR, microarray analysis, next-generation sequencing (NGS), viral DNA detection and other downstream assays.

Components

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Magnetic Microspheres N	1.1 mL	2×1.1 mL
Buffer ATL	20 mL	35 mL
Buffer AL	20 mL	35 mL
Buffer BD*	5 mL	15 mL
Proteinase K	24 mg	48 mg
Protease Dissolve Buffer	1.8 mL	5 mL
Buffer BW1*	44 mL	66 mL
Elution Buffer	10 mL	30 mL

Storage

Proteinase K and Magnetic Microspheres N shall be stored at 2–8 °C; all other reagents are stored at room temperature. The shelf life is 18 months.

Instructions

Preparations

1. Prior to first use, dilute Buffer BW1 with absolute ethanol as instructed on the bottle label.
2. Prior to first use, dilute Buffer BD with absolute ethanol as instructed on the bottle label.
3. 75% Ethanol.

Sample Lysis and Digestion

1. **Liquid specimens (whole blood, serum, plasma, cell suspension, etc.)**
   Add 20 µL Proteinase K and 200 µL liquid sample (whole blood, plasma, serum, cell suspension or other liquid matrices) into a 1.5 mL centrifuge tube. Add 200 µL Buffer AL, invert to mix thoroughly 3 times, then incubate with shaking at 70 °C for 10 min.
2. **Animal tissue (≤10 mg tissue input)**
   Transfer ≤10 mg tissue sample to a 1.5 mL centrifuge tube. Add 20 µL Proteinase K and 200 µL Buffer ATL, then incubate with shaking at 55 °C for 30–120 min until complete tissue digestion. Add 200 µL Buffer AL, vortex for 5 sec, and incubate in a 70 °C water bath for 10 min.
3. **Dried blood spots (FTA Card or other filter paper blood spots)**
   Transfer 1–5 pieces of 3 mm-diameter blood spots to a 2.0 mL centrifuge tube. Add 20 µL Proteinase K and 300 µL Buffer ATL, incubate with shaking at 1200–1500 rpm and 55 °C for 60 min. Add 150 µL Buffer AL, then incubate with shaking at 1200–1500 rpm and 65 °C for 20 min.
4. **Dry swab specimens**
   Place the dry swab into a 2 mL centrifuge tube, add 500 µL Buffer ATL and 20 µL Proteinase K, then incubate with shaking at 65 °C for 30 min.
5. **Wet swabs (preserved in cell storage medium)**
   Centrifuge at 10,000 × g for 1 min to pellet exfoliated cells. Aspirate excess storage medium, leaving 250 µL medium together with the swab. Add 150 µL Buffer AL and 20 µL Proteinase K, then incubate with shaking at 900–1200 rpm and 65 °C for 30 min.
6. **Saliva specimens**
   Add 20 µL Proteinase K and 450 µL saliva or swab eluate into a 1.5 mL centrifuge tube, then incubate with shaking at 55–65 °C for 30 min.

7. **Cultured cells (max. 1 × 10^6 cells) and exfoliated cells**
   Transfer appropriate volume of liquid sample (culture medium, urine, amniotic fluid, ascites, etc.) to a centrifuge tube. Centrifuge at 2,000 × g for 10 min to pellet cells, discard supernatant, leaving 50 µL residual liquid to resuspend the pellet by vortexing. Add 150 µL Buffer ATL and 20 µL Proteinase K, incubate with shaking at 55 °C for 20 min, then add 200 µL Buffer AL and mix well.
8. **Paraffin-embedded tissue sections**
   Transfer paraffin sections to a 1.5 mL centrifuge tube. Centrifuge at 14,000 × g for 1 min to pellet tissue at the tube bottom. Add 20 µL Proteinase K and 350 µL Buffer ATL to the sample, incubate with gentle shaking at 65 °C for 60 min, followed by incubation at 90 °C for another 60 min. Centrifuge at 14,000 × g for 1 min. Carefully pierce the paraffin layer with a pipette tip and transfer 200 µL of the lower digested liquid to a new centrifuge tube. Add 150 µL Buffer AL and vortex for 5 sec to homogenize.

Procedure

1. Transfer 400–450 µL digested lysate (from Sample Lysis and Digestion) into a 1.5 mL centrifuge tube.
2. Add 450 µL Buffer BD and 20 µL Magnetic Microspheres N to the sample. Invert the tube 10–15 times for thorough mixing, then incubate at ambient temperature for 5 min with several inversions during incubation.
3. Place the tube on a magnetic rack for 3 min to capture beads, then pour out or aspirate all liquid.
4. Add 500 µL Buffer BW1 and vortex for 15 sec. Set the tube on the magnetic rack for 2 min to capture beads, then discard all liquid.
5. Add another 500 µL Buffer BW1, vortex for 15 sec. Place on the magnetic rack for 2 min and discard liquid.
6. Add 500 µL 75% ethanol, vortex for 15 sec. Place on the magnetic rack for 1 min and discard liquid.
7. Add another 500 µL 75% ethanol, vortex for 15 sec. Place on the magnetic rack for 1 min and discard liquid.

8. Perform brief centrifugation to collect residual liquid on tube walls. Aspirate all leftover liquid completely and air-dry beads for 5 min.
9. Add 30–100 μL Elution Buffer, vortex fully to resuspend magnetic beads, then incubate with shaking at 55 °C for 10 min.
10. Place the tube on the magnetic rack for 2 min to separate beads, then transfer the purified DNA supernatant to a new centrifuge tube.