Mag Beads Cell-Free DNA Extraction Kit

【Product Name】

Mag Beads Cell-Free DNA Extraction Kit

【Package Specifications】

10T/box（Art.No.GP401-10），20T/box（Art.No.GP401-10），

50T/box（Art.No.GP401-10），100T/box（Art.No.GP401-10）

【Intended Use】

Designed for the extraction, enrichment, and purification of free DNA from 0.4-5mL volumes of samples such as plasma, serum, etc. The processed product is intended for clinical in vitro diagnostics.

【Detection Principle】

DNA binds to the surface of silicon-coated Magbeads under high salt conditions. After multiple washes to remove impurities such as proteins, elution is performed under low salt conditions, resulting in high-purity free DNA.

【Main Components】

Components	GP401-10 （ 4mL sample）	GP401-20 （4mL sample）	GP401-50 （ 4mL sample）	GP401-100 （ 4mL sample）
Lysate	44mL（+ 18.9mL isopropanol）	87.5mL（+37.5mL isopropanol）	220.5mL（+ 94.5mL isopropanol）	441mL（+189mL isopropanol）
Washing buffer	6mL（+6mL isopropanol	12mL（+12mL isopropanol）	30mL（+30mL isopropanol）	60mL（+60mL isopropanol）
Eluant	1.5mL	3mL	8mL	15mL
Beads	0.9mL	1.8mL	4.5mL	8.5mL
Proteinase K	4.5mL	8.5mL	21mL	42mL

【Storage Conditions and Shelf Life】

The magnetic bead suspension should be stored at 2-8°C, proteinase K should be stored below 4°C, and the remaining reagents can be stored at room temperature. The shelf life for all components is one year.

Transportation can be done between 4-37°C, and the shipping duration should not exceed 14 days.

【User-provided Reagents and Equipment】

1. Equipment: Nucleic acid extractor , 2.2mL 96 deep well plate (U-bottom), magnetic rod sleeve, magnetic stand, vortex shaker, constant temperature shaker, etc.

2. Reagents:80% ethanol.

【Sample Requirements】

1． Applicable Sample Types: Serum, plasma, etc.

2． Sample Storage: Extraction can be performed immediately, or the samples can be stored at 2-8°C for testing, with a storage period not exceeding 24 hours. For long-term storage, samples should be kept at -20°C.

【Precautions】

1． Before the experiment, carefully read the instructions for this kit and strictly follow the operating procedures.

2． Avoid freezing the magnetic beads; mix the magnetic bead suspension thoroughly before use.

3． Before each use, check for any precipitation in each component. If present, re-dissolve at 37°C.

4． For the first use, add the specified amount of absolute ethanol according to the label instructions on the washing solution.

【Manual Centrifuge Tube Extraction Operating Steps】

1. Sample Lysis and Binding

For samples of different volumes, refer to the table below and add the corresponding volumes of proteinase K, magnetic bead suspension, and lysis buffer. Vortex mix for 10s, let it stand at room temperature for 20min, vortex mix 4-5 times during this period.

Sample volume	Consumables specifications	Proteinase K	Bead suspension	Lysate
0.4mL	2mL centrifuge tube	40μL	10μL	0.6mL
0.5mL		50μL		0.75mL
1mL	5mLcentrifuge tube	100μL	20μL	1.5mL
2mL	10mLcentrifuge tube	200μL	40μL	3.0mL
3mL		300μL	60μL	4.5mL
4mL	15mLcentrifuge tube	400μL	80μL	6.0mL
5mL		500μL	100μL	7.5mL

Note: 1) If frozen plasma is used, it should be pre-treated at 4°C, 16000g for 10 minutes, and the supernatant should be collected for further use.

2) (Optional) For each 1mL sample, 1μL of Carrier RNA (6μg/μL, to be provided by the customer) can be added externally to increase the binding efficiency of magnetic beads and enhance the extraction yield.

2. Magnetic Separation:

Place the centrifuge tube on the magnetic stand and let it stand for 20 seconds until the magnetic beads are fully adsorbed. If there is residual magnetic bead liquid in the tube, invert the tube 2-3 times to ensure complete adsorption. Keep the tube fixed on the magnetic stand, use a pipette to discard the supernatant, and avoid contact with the magnetic beads.

3. Washing:

1) Remove the tube from the magnetic stand, add 1mL washing solution, vortex mix for 1 minute, and then transfer the resuspended magnetic bead solution to a 1.5mL centrifuge tube. Place it back on the magnetic stand for magnetic separation.

2) Note: Temporary retention of the 5-15mL centrifuge tube may contain residual magnetic beads. Transfer the magnetic bead solution from the 1.5mL centrifuge tube to a larger centrifuge tube for rinsing, then transfer it back to the corresponding 1.5mL centrifuge tube for magnetic separation.

3) Remove the tube from the magnetic stand, add 1mL 80% ethanol, vortex mix for 30 seconds, and let it stand for 1 minute for magnetic separation.

4) Remove the tube from the magnetic stand, add 1mL 80% ethanol, vortex mix for 30 seconds, and let it stand for 1 minute for magnetic separation.

4. Ethanol Removal:

Keep the tube on the magnetic stand and let it stand in a ventilated area for 5 minutes for ethanol evaporation.

5. Elution:

Remove the tube from the magnetic stand, add 25-100μL elution solution, vortex mix to fully suspend the magnetic beads in the elution solution, and shake at room temperature for 5 minutes (or at 55°C for 5 minutes).

Note: It is recommended to preheat or heat the elution solution to 55°C in advance to improve the extraction yield.

6. Nucleic Acid Transfer:

Place the tube on the magnetic stand and let it stand for 1 minute. After the magnetic beads are fully adsorbed, transfer the supernatant to a new centrifuge tube and store at

-20°C for future use.

【Automated Extraction - 24 Channel Nucleic Acid Extractor Operating Steps】

(Using a 4mL serum sample as an example)

1. Sample Preparation: Add the specified amounts of reagents to each corresponding well in the reagent strip, synchronously processing 24 samples.

Position	1	2	3	4	6
Reagent	Binding buffer（6mL）	Washing buffer（1mL）	80% Ethanol（1mL）	80% Ethanol（1mL）	Eluant（40μL）

2. Sample Addition (Thaw frozen samples in advance): Add 4mL serum sample, 80μL magnetic bead suspension, and 400μL proteinase K to well #1 of the reagent strip.

3. On-Machine Extraction: Place the prepared reagent strip into the QP-AUT-24 nucleic acid extractor or a similar extractor, and insert the magnetic rod sleeve. Open the instrument's operating program, select the appropriate program, click "Run," and start the extraction.

4. Nucleic Acid Transfer: After the instrument operation is complete, transfer the elution solution from well #6 of the extraction strip to a clean centrifuge tube free of nucleases, and store at -20°C for future use.

The parameters for the 24-channel nucleic acid extractor (QP-AUT-24) program are set as follows

Step	Site	Name	Waiting time(min)	Mixing time（min）	Suction time(sec)	Volume (μL)	Mixing velocity	Ttemperature
1	1	Lysis and combination	2.0	5.0	0	10000	5	OFF
2	1	Lysis and combination	2.0	5.0	0	10000	5	OFF
3	1	Lysis and combination	0.0	5.0	800	10000	5	OFF
4	2	Washing 1	0.0	1.0	120	1000	10	OFF
5	3	Washing 2	0.0	1.0	120	1000	10	OFF
6	4	Washing 3	1.0	0.5	0	1000	10	OFF
7	4	Washing 3	3.0	0.5	120	1000	10	OFF
8	6	Elution	0.0	5.0	180	40	4	37℃
9	4	Abandon beads	0.0	1.0	0	1000	10	OFF

【Basic Information】

Version Number: 1.1

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