MGIEasy Nucleic Acid Extraction Kit User Manual

Manual Version：A2

【Product Name】

MGIEasy Nucleic Acid Extraction Kit

【Package】

Cat. No.	Model	Specification
1000020471	T-96	96 preps
1000020261	T-1728	1728 preps

【Intended Use】

MGIEasy Nucleic Acid Extraction Kit can efficiently purify the viral DNA and RNA from throat swabs, BALF (bronchoalveolar lavage fluid) and is suitable for use in downstream molecular detection. This kit is either suitable for manual or automated extraction on MGISP-960（High-throughput automated sample preparation system）.

【Kit Components】

Table 1. Main Components and specification

	Reagent	Package and amount	
		96 Preps	1728 Preps
Box1	Buffer MLB	20 mL×1 bottle	400 mL×1 bottle
	Buffer MW1	12 mL×2 bottles	420 mL×1 bottle
	Buffer MW2	12 mL×1 bottle	220 mL×1 bottle
	RNase Free Water	10 mL×1 bottle	180 mL×1 bottle
	Proteinase K	1.5 mL×1 tube	28 mL×1 bottle
	Magnetic Beads M	1.5 mL×1 tube	28 mL×1 bottle
Box2	Enhancer Buffer	100 μL×1 tube	2 mL×1 tube

Note: Not to mix components in different batches of kits.

【Storage Conditions】

Different reagents in this kit have different storage conditions. Please store them respectively according to the following conditions:

Table 2. Reagents storage conditions and validity period

Reagent	Storage Conditions	Validity Period
Enhancer Buffer	-25°C to-15°C	12 months
Proteinase K	2°C to 8°C	12 months
Magnetic Beads M	2°C to 8°C	12 months
Others	0°C to 30°C	12 months

Note: The Buffer MLB may have some precipitation which will not affect the function. If the precipitation occurs, please heat the reagent bottle in a 37°C water bath properly for around 10 min until the precipitation disappear, then mix thoroughly for use.

【 Applicable Automation Instrument 】

Applicable automation instrument: High-throughput automated sample preparation system

Model: MGISP-960

【 Sample Conditions 】

1. Sample type: throat swabs and BALF samples
2. The samples are recommended to be extracted within 24 h at 4°C after collection; If can't be extracted within 24 h, the samples should be stored at -70°C or below. Avoid repeated freezing and thawing; Frozen samples need to be thawed and mixed before use.
3. Sample transportation: use dry ice for transportation. Don't transport the samples exceeding 7 days. Avoid repeated freezing and thawing during transportation.
4. Sample Safety: All samples are regarded as potentially infectious items. The operations shall be performed in accordance with relevant national standards.

【 Experimental Workflow 】

Please follow the workflow as below:

A. Required Materials Not Supplied

a) Required Materials for Manual Workflow

Table 3. Required Materials for Manual Extraction

Type	Item Name	Note
Instrument	Table top centrifuge	Rotation speed not lower than 10,000 rpm/min
	Vortex	/
	Metal heater	Or instead by water bath
	1.5 mL tube magnets	/
	Pipette	1 mL, 200 μL, 20 μL
Reagent	Absolute ethanol	AR
Consumable	1.5 mL centrifuge tube	Nonstick, DNase-free, RNase-free
	Tips	1 mL, 200 μL, 20 μL
	50 mLtube	DNase-free, RNase-free

b) Required Materials for MGISP-960 Automatic Workflow

Table 4. Required Materials for Automatic Extraction

Type	Item Name	Note
Instrument	Plate centrifuge	/
	Vortex	/
	Pipette	1 mL, 200 μL, 20 μL
Reagent	Absolute ethanol	AR
Consumable	Tips	1 mL, 200 μL, 20 μL
	250 μL automated filter tips	Cat. No. 1000000723, MGI
	1.3 mL U-bottom deep-well plate	Cat. No. 1000004644, MGI
	Hard-shell thin-wall 96-well skirted PCR plates, white shell/clear well	Cat. No. 1000012059, MGI
	50 mL tube	DNase-free, RNase-free

B. Read before use

1. This product is for scientific research purposes only and is not intended for clinical diagnosis.
2. Avoid repeatedly freezing and thawing samples, which may result in low DNA or RNA quality.
3. If Buffer MLB and Buffer MW1 has a precipitate, it can be re-dissolved in a 37 °C water bath. Shake and mix well before use.

4. All reagents and samples need to equilibrate to room temperature (10°C -30°C) before use.
5. Before use, please make sure to add absolute (100%) ethanol into Buffer MW1 and Buffer MW2 according to the amount indicated on the reagent bottle label.
6. Please use the recommended consumables for automated or manual operations.
7. Please read the manual carefully before the experiment.
8. If you have other questions, please contact MGI technical support:

   MGI-service@genomics.cn

C. Manual Extraction Standard Workflow

1. Preparation of Buffer Mixture：Please prepare the mixture as following: Each sample needs 200 μL Buffer MLB, 250 μL absolute ethanol, 15 μL Proteinase K, 15 μL Magnetic Beads M, 1 μL Enhancer Buffer. Please dispense 460 μL Buffer Mixture for each sample in 1.5 mL tube.

   Note：Mix Magnetic Beads M thoroughly before use.

   Note：The prepared Buffer Mixture needs to dispense to the sample tube in 30 min. If need to prepare in advance, please add Proteinase K in the Buffer Mixture before dispensing, avoiding the proteinase inactivation

2. Add 200 μL sample to the prepared buffer mixture, mix well by vortexing, and incubate at room temperature for 10 min, vortex once during this period.
3. Centrifuge instantaneously and place it on the magnetic stand for 1 min. After the liquid clears, carefully discard the supernatant liquid.
4. Remove the centrifuge tube from the magnetic stand. Add 500 μL Buffer MW1 (ensure that absolute ethanol has been added), and mix well for 5-10 s, incubate at room temperature for 1 min.
5. Centrifuge instantaneously and place the centrifuge tube on the magnetic stand for 1 min. After the liquid is completely clear, carefully discard the supernatant.
6. Remove the centrifuge tube from the magnetic stand. Add 500 μL Buffer MW2 (ensure that absolute ethanol has been added), and mix well for 5-10 s, incubate at room temperature for 1 min.
7. Place the centrifuge tube on the magnetic stand for 1 min. After the liquid is completely

clear, carefully discard the supernatant.

8. Remove the centrifuge tube from the magnetic stand. Add 600 μL absolute ethanol, and mix well for 5-10 s, incubate at room temperature for 1 min.

9. Centrifuge instantaneously and place the centrifuge tube on the magnetic stand for 1 min, after the liquid is completely clear, carefully discard the supernatant. Open the tube, and dry at room temperature for 5-10 min to ensure that the ethanol is completely evaporated.

10. Remove the centrifuge tube from the magnetic stand. Add 50 μL RNase free Water, mix by vortexing and place it on a metal heater. Incubate at 56°C, 1000 rpm for 5 min.

11. Centrifuge instantaneously and place the centrifuge tube on the magnetic stand. After the liquid is completely clear, carefully transfer the 45 μL DNA solution to a new 1.5 mL centrifuge tube. Label and store at -80°C.

✔ **Stopping point: The extracted samples can be stored in the -80°C refrigerator for a long time.**

D. MGISP-960 Automated Extraction Standard Workflow

D.1. MGISP-960 Automated Extraction Preparation

1. Instrument Setup

1) Before first use, install application scripts according to ***MGISP-100 & MGISP-960 Application Script Installation Instructions***.

2) Perform a pre-clean after powering on the device and before experiment according to ***MGISP-100 & MGISP-960 Cleaning Instructions***.

2. Preparing Consumables

Take out the consumables required for one workflow at room temperature for further use, as listed in the table below:

Table 5. Customer-prepared Materials for MGISP-960 Automated Extraction

Consumables	Brand	Cat. No.	Quantity
250 μL automated filter tips	MGI	1000000723	4 Boxes
1.3 mL U-bottom deep-well plate	MGI	1000004644	5 Plates
Hard-shell thin-wall 96-well skirted PCR plates, white shell/clear well	MGI	1000012059	1 Plate

3. Preparing Samples

The script of MGISP-960 automation system is suitable for 96 sample.

According to the type of sample, the samples need to be prepared before running on MGISP-960. Take more than 160 μL sample to a deep-well plate (MGI, 1000004644) so that there have 160 μL sample can be transfered. And make sure that there are no air bubbles at the bottom and no hanging liquid on the side walls. Keep on ice for later use.

4. Preparing Reagents

1) Preparation of Buffer MW1: Absolute ethanol needs to be added according to the label.

2) Preparation of Buffer MW2: Absolute ethanol needs to be added according to the label.

3) Preparation of Buffer Mixture: Please prepare the mixture as following: each sample needs 160 μL Buffer MLB, 200 μL absolute ethanol, 15 μL Proteinase K, 15 μL Magnetic Beads M, 1 μL Enhancer Buffer.

   Note：Mix Magnetic Beads M thoroughly before use.

   Note：The prepared Buffer Mixture needs to dispense to the sample tube in 30 min. If need to prepare in advance, please add Proteinase K in the Buffer Mixture before dispensing, avoiding the proteinase inactivation

4) Take out 5 U-bottom deep-well plate (MGI, 1000004644), label the plate and add the reagents according to the table 6.

Table 6. Reagent Volume of Sample, Buffer Mixture, RNase Free Water, Buffer MW1, Buffer MW2

Reagent	Consumables	Brand	Cat. No.	Volume to add for each well
Sample	U-bottom deep-well plate	MGI	1000004644	> 160 μL
Prepared Buffer Mixture	U-bottom deep-well plate	MGI	1000004644	360 μL
RNase Free Water	U-bottom deep-well plate	MGI	1000004644	50 μL
Buffer MW1	U-bottom deep-well plate	MGI	1000004644	170 μL
Buffer MW2	U-bottom deep-well plate	MGI	1000004644	340 μL

D.2. MGISP-960 Operation

1) Double-click the icon of MGISP-960 on the desktop. The mode selection interface is displayed, as shown in following figure 1. Select "**Real**" and click "**Create**".

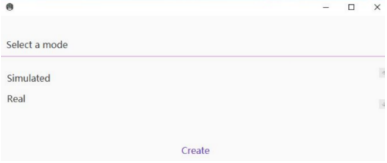

Figure 1. Mode Selection Interface

2) In the Authentication interface, click "**User Entry**" to enter the initialization interface.

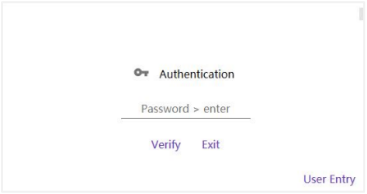

Figure 2. Authentication Interface

3) The initialization interface is displayed, as shown in following figure 3.

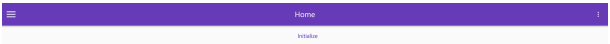

Figure 3. Initialization Interface

4) Click **"Initialize"**. The initialization takes about 2 min. If Initialize successfully is displayed (as shown in following figure 4, the device is connected successfully, and you can go to the next step

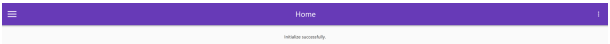

Figure 4. Initialization Successful Interface

Note: If the initialization fails, check whether the power switch is turned on, and whether more than one software program is running. Try to restart the software. If the problem persists, contact MGI technical support.

5) Click the menu button and select "**Run Wizard**" in the menu. In the Run Wizard interface, click "**Solution**", and select **[JB-A09-039 MGISP-960 Nucleic Acid Extraction Kit_RV1.0_SV1.0]**, click "**Script**", to select **[JB-A09-039 MGISP-960 Nucleic Acid Extraction Kit]**, operation deck arrangement of the first phase is displayed, as shown in following figure 6 and table 7. Follow the on-screen instructions to place the consumables, samples, and reagents, as shown in the figure 6. Confirm the placement and close the door.

Figure 5. Run Wizard Interface

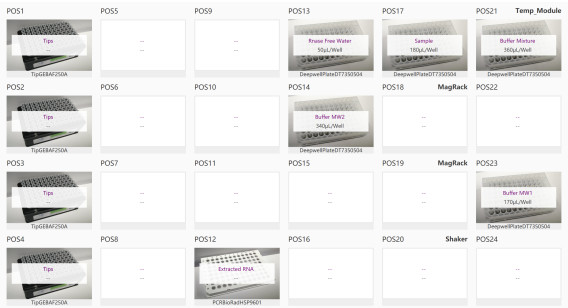

Figure 6. First Phase Operation Deck Arrangement

Table 7. First Phase Operation Deck Arrangement

Name	Position
250 μL automated filter tips	Pos1-Pos4
Hard-shell thin-wall 96-well skirted PCR plates, white shell/clear well	Pos12
Buffer Mixture	Pos21

Sample	Pos17
RNase Free Water	Pos13
Buffer MW1	Pos23
Buffer MW2	Pos14

6) Click "**Run**" to start extraction workflow.

7) It is expected to run 1 h. After the process is finished, the product at Pos12 is taken out.

8) Perform the next testing operation.

9) Dispose of the used deep-well plates, PCR plates, and waste bag to the designated waste area. Perform a post-clean before powering off the device according to ***MGISP-100 & MGISP-960 Cleaning Instructions***.

✔ **Stopping point：The extracted samples can be stored in the -80 °C refrigerator for a long time.**

【Precautions】

1. This product is only used for scientific research, not for clinical diagnosis, please read this instruction carefully before use;
2. Please familiarize the operation and precautions of various instruments to be used before testing;
3. When all the reagents are taken out from the specified storage environment, please use them according to the requirements. The reagents should be shaken and mixed before use;
4. The micro- Pipette should be used for sample addition;
5. All samples and reagents should be avoided to directly contact with skin and eyes; do not swallow, once happen, immediately rinse with plenty of water and go to the hospital for treatment in time;
6. All samples and various wastes should be treated in accordance with relevant regulations.

【 Production Company Information 】

Company: MGI Tech Co., Ltd.

Address: 2/F, Building 11, Beishan Industrial Zone, Yantian District, Shenzhen, CHINA, 518083

Website: en.mgitech.cn

Email: MGI-service@genomics.cn

Service Hotline: (+86) 4000-966-988