Troubleshooting Guide

Problem	Causes	Comments and Suggestions
Physical damage of the kit	Upside down during transportation may cause beads to stick with sealing film	Spin down the 'Cartridge' by hand before open it.
	Sealing film is detached and reagent is spilled to other wells due to improper storage temperature	Spin down by hand and measure reagent volume with eyes. If reagent volumes are insufficient, extraction efficiency may decrease. Do not use it and contact customer service immediately.
	Broken 'Cartridge'	Broken 'Cartridge' may lead to unfavorable result. Do not use it and contact customer service immediately.
Inappropriate specimen condition	Specimen condition is not favorable due to inappropriate storage condition (ex. coagulation)	Perform vortex and pipetting of specimen. If sample is still coagulated, add a bit of PBS or distilled water and vortex again.
	Specimen condition is not favorable due to inappropriate storage condition (ex. stored in room temperature)	Increase sample volume up to 250 µl, if extraction efficiency is low.
Magnetic rod function failure	Stain on the magnetic rod	Ensure the 'Strip' is inserted properly before extraction. Clean magnetic rods using 70% concentration of ethanol and clean with cloth.
Extractor malfunction	System is not working	Make sure system is plugged. Refer to user manual of AllEx®64 for further details.
	Liquid spilled and adhered to system	Use UV light for sterilization and then clean with 70% concentration of ethanol.
	Collision	Improperly attached the Cartridge, Cassette and Strip may cause collision. Turn off the system and make sure Cartridge, Cassette and Strip are properly attached.
	Not available to load the 'Cartridge' into the 'Cassette'	Check whether the 'Cartridge' is loaded in the correct position. Confirm absence of any any foreign substances on the 'Cartridge'. Check whether the 'Cartridge' is deformed or bent.
	Not available to load the 'Strip' into the 'Strip Loader'	Check whether the 'Strip' is deformed or bent.
	UV lamp doesn't switch on	The UV lamp could be disconnected from the power or out of order. Check the cumulative usage time of the UV and replace it if necessary.
Abnormal extraction	Too much beads left in Elution buffer	If the total nucleic acid density is within the normal range, proceed with the eluted solution. In the case of low total nucleic acid density, transfer the eluted solution to a 1.5 ml tube and centrifuge before use.
	Eluted total nucleic acid should not appear transparent or sticky	Refer to 'Inappropriate specimen condition' part of trouble shooting if specimen condition is unfavorable, perform extraction again. If the specimen condition and total nucleic acid density are favorable, proceed with the extracted total nucleic acid. In cases where the specimen condition is favorable but the total nucleic acid density is unfavorable, transfer the eluted solution to 1.5 ml tube and centrifuge before use. If the result remains unfavorable, dilute it with elution buffer provided in AllEx® Viral DNA/RNA kit before use.

Storage Conditions

- Temperature : Room Temperature (15~25˚C)
- Humidity : 20~80%

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GENEALL BIOTECHNOLOGY CO., LTD

Symbol	Used for	Symbol	Used for
LOT	Batch number		Manufacturer
REF	Catalogue number		Do not reuse
	Consult Instructions For Use		Date of Manufacture
	Caution		Expiry date
	Temperature limitation		

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Ver 1.1

GeneAll®

Store at room temperature (15~25°C)
Shelf life is 18 months after manufacturing

AllEx®

Viral DNA / RNA Kit (Single Cartridge / Plate Cartridge)

Description

AllEx® Viral DNA/RNA Kit is designed for the easy and rapid Viral DNA/RNA extraction from a wide range of sample materials in combination with AllEx®64 Automated Nucleic Acid Extraction system. Protocols for Viral DNA/RNA extraction are available in either for low throughput of 1 to 8 samples using the flexible-Single Cartridge or high throughput of 1 to 64 samples using the 96-well Plate Cartridge.

The extracted Viral DNA/RNA is of excellent quality and suitable for most downstream applications including PCR, qPCR, RT-PCR, or any downstream application.

User can take advanced of the Kit's user-friendly design, automation capabilities, and the high quality of the extracted genetic material, ensuring reliable and accurate results for molecular biology applications.

Kit Contents

Components	Quantity	
	934-048 (Single Cartridge Type)	934-096 (Plate Cartridge Type)
Number of Preparation	48 preps/kit	96 preps/kit
Pre-filled with reagents	6 Single Cartridges	6 Plate Cartridges
AllEx® Strip (6 pcs/pk)	4 pks	2 pks
Carrier RNA (lyophilized) 370 µg *	1 tube	2 tubes
Nuclease-free water 1 ml	1 tube	2 tubes

** Reconstitute the lyophilized Carrier RNA by adding 370 µl of Nuclease-free water (provided) before use.*


Single Cartridge


Single Cartridge Adaptor


Combination of Single Cartridge and Adaptor

- Single Cartridge pre-filled with reagents
- The Single Cartridge Adaptor holds up to 8 Cartridges and users may choose to use 4 Adaptors to extract 32 samples in a single run

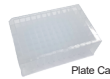


Plate Cartridge


AllEx® Strip

- Plate Cartridge pre-filled with reagents
- AllEx® Strip

Brief workflow

Single Cartridge

Plate Cartridge

1. Lysis buffer
2. Washing buffer I
3. Washing buffer II
4. Washing buffer III + bead
   [Note] If particles are not visible in well 4, shake down the cartridge to dislodge particles that may have adhered to the seal material before removing the seal.
5. Elution buffer
6. Washing buffer IV

- Single Cartridge is specially designed for low to medium throughput and allows for the processing of flexible sample numbers in multiples of samples. The use of individual Single Cartridge avoids the sealing of unused wells of a Plate Cartridge when processing less than 16 samples.
- Plate Cartridge is capable of extracting 16 samples as single extraction requires 6 consequent wells. 6 consequent wells are aligned horizontally and each well contains specific reagents for extraction. Both kits can be used with same hardware allowing users to switch between the two methods according to the requirements in sample throughput. The first well contains lysis buffer that disrupts cell membranes and elutes total nucleic acid with magnetic beads.
- Magnetic bead may be damaged if stored with lysis buffer, hence it is located in the fourth well until the extraction begins and moves to first well by AllEx®64 once initiated. Second, third, fourth and sixth well contain washing buffer I, II, III, IV in order to remove unwanted cell component and buffers. The elution buffer in fifth well detaches total nucleic acid from magnetic beads, completing extraction process.

Protocol

Protocol	Feature
P1 Protocol (12 min 43 sec)	• Rapid, efficient and PCR-compatible nucleic acid extraction
P2 Protocol (19 min 23 sec)	• High-quality nucleic acid extraction for NGS-grade applications

A. Whole blood, Serum, Plasma, Buffy coat, Cultured cell

1. Dispense 7 µl of Carrier RNA solution to 1st (7th) well.
2. Dispense up to 200 µl of liquid sample to 1st (7th) well.
3. *(Optional)* If hemolysis occurs in the blood sample, dilution with a 1:1 ratio using 1X PBS is recommended.

B. CSF, BAL, Urine, Body Fluid

1. Transfer 1.5 ml of sample to a 1.5 ml microcentrifuge tube and centrifuge at 13,000 rpm for 3 min.
2. Discard the supernatant. If the amount of cell is not enough, repeat step 1.
3. Add 300 µl of Buffer CL(not provided) and mix thoroughly by vortexing.
4. Incubate at 90°C for 15 min. Spin down briefly to remove any drops from inside of the lid.
5. Incubate at RT for 2 min.
6. *(Optional)* Add 20 µl of Proteinase K solution(not provided) and mix by vortexing briefly. Incubate at 60°C for 10 min and spin down briefly to remove any drops from inside of the lid.
7. Transfer up to 200 µl of liquid sample to 1st (7th) well.
8. Dispense 7 µl of Carrier RNA solution to 1st (7th) well.

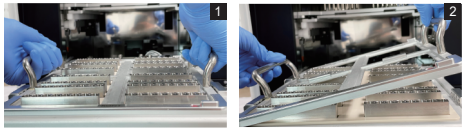
C. Buccal swab

1. Place the swab sample in a 2 ml microcentrifuge tube. Clip off the handle with sterile sharp blade or wire cutter.
2. Add 300 µl of Buffer CL (not provided).
3. Mix thoroughly by vortexing for 1 min and incubate for 10 min at room temperature.
4. Centrifuge at 13,000 rpm for 1 min at room temperature.
5. Carefully remove the supernatant without disturbing the cell pellet.
6. Add 200 µl of 1X PBS and mix to resuspend pellet.
7. Dispense 7 µl of Carrier RNA solution to 1st (7th) well.

D. Saliva

1. Add 1 ml of 1X PBS to the 1 ml of the saliva sample.
2. Centrifuge at 13,000 rmp for 1 min at RT.
3. Carefully remove the supernatant without disturbing the cell pellet.
4. Add 200 µl of 1X PBS and mix to resuspend pellet.
5. *(Optional)* dispense 15 µl of Proteinase K solution (not provided) to 1st (7th) well.
6. Transfer 200 µl of sample to 1st (7th) well.

Preparation of 'Cassette'



1. Prepare the 'Cassette'.
2. If the 'Cassette' is inside the system, tap **'Cassette Loader Move Front'** icon to detach 'Cassette' from the 'Cassette Loader'.

Preparation of Single Cartridge

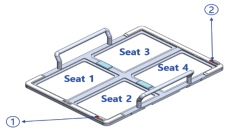
1. Cut the Single Cartridge as required.
2. Insert the 'Cartridge' into the 'Adaptor' and remove the sealing film.
3. Follow the protocol for starting sample type.

Preparation of Plate Cartridge

1. Remove the sealing film.
2. Follow the protocol for starting sample type.

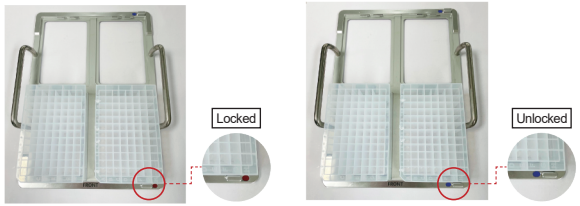
System Run

1. Unlock the Seat 1 and 2 Lock Switch and the Seat 3 and 4 Lock Switch of the 'Cassette' .These switches are located on the sides of the 'Cassette'.

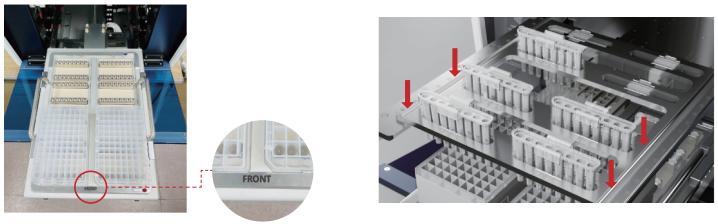


① Seat 1 and 2 Lock Switch
② Seat 3 and 4 Lock Switch

2. Install the 'Cartridge' from Seat 1 of the 'Cassette'. If there is more than one 'Cartridge', install Seats 2, 3, and 4 in that order.
3. **[Note!]** Once all the 'Cartridges' are installed, Lock the Lock Switch.



4. Load the 'Cassette' into the 'Cassette Loader' in the correct position until it clicks.The 'FRONT' of the 'Cassette' should face forward.



5. *(Optional)* Tap the 'Sample ID' icon to open the sample data screen. Tap the appropriate number corresponding to the sample quantity and save.
6. **[Note!]** Tap the 'Strip Loader' icon to move the' Strip Loader' forward. The Strip Loading Guide will be displayed on the screen. Ensure that you insert the strip in the correct position as indicated by the Strip Loading Guide.
7. Tap the 'Strip Loader Move Home' icon to return the 'Strip Loader' to its original position.
8. Tap the 'Cassette Loader Move Home' icon to return the 'Cassette Loader' to its original position.
9. Select the protocol and tap the 'Okay' icon to run.

End of Run

1. Tap the **'Cassette Loader Move Front'** icon to move 'Cassette Loader' forward and open the front door.
2. Tap the **'Strip Loader'** icon to move 'Strip Loader' forward and remove the used 'Strip'.
3. Hold up the handle of 'Cassette' up with both hands to detach it from the 'Cassette Loader'.
4. Tap the **'Cassette Loader Move Home'** icon to return the 'Cassette Loader' to its original position.
5. Regular UV sterilization eliminates bacteria and virus, minimizing internal pollution within the system. Before/after the extraction, remove the 'Cartridge' and 'Strip', and then press. The sterilization will continue for 10 minutes.