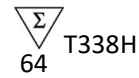




# Viral DNA and RNA Extraction Kit

## User Guide



Version 1.0



In-Vitro Diagnostics / For use with Automatic nucleic acid extractor compatible with  
Viral DNA and RNA Extraction Kit



T338H



**Xi'an Tianlong Science and Technology Co., Ltd.**

No.389, Zhuhong Road, Xi'an, 710018, Shaanxi, P.R. China;  
2-3F, No. 2 Building, Yuanzheng Innovation Park, Caotan Ecological Zone, No.1258, Hongye Road,  
Economic & Technological Development Zone, Xi'an, 710018, Shaanxi, P.R. China.



**SUNGO Europe B.V.**

Olympisch Stadion 24, 1076DE Amsterdam, Netherlands.

# Contents

|   |   |
|---|---|
| Intended Use .....  | 1 |
| Product Performance Indicators .....                        | 1 |
| Special Notes .....   | 1 |
| Testing Principle .....                                     | 1 |
| Kit Contents .....  | 2 |
| Materials Required but not Provided .....                   | 2 |
| Warnings and Precautions .....                              | 2 |
| Reagent Storage and Handling .....                          | 3 |
| Sample Handling and Storage .....                           | 4 |
| Operation Guide .....                                       | 4 |
| 1. Automated Extraction Process .....                       | 4 |
| 2. Operation Steps of Automated Extraction .....            | 4 |
| 2.1 Automatic Nucleic Acid Extractor (model:GeneFlex) ..... | 4 |
| Troubleshooting Guide .....                                 | 6 |
| Quality Control .....                                       | 7 |
| Limitations of Test Methods .....                           | 7 |
| Safety Symbols and Signs .....                              | 7 |
| Contact Information .....                                   | 8 |

The **Viral DNA and RNA Extraction Kit** is designed to rapidly extract viral DNA and RNA from whole blood, serum, plasma, interstitial fluid, urine and swab samples. The extracted viral DNA and RNA are of high purity and stability, and can be used in a variety of routine operations, including enzyme digestion, Polymerase Chain Reaction (PCR), DNA library constructions, Southern hybridization and blotting, Next-Generation Sequencing (NGS) and other experiments.

The **Viral DNA and RNA Extraction Kit** is intended to be used by professionals, such as biotechnologists, microbiologists, clinical technicians, and physicians who are trained in molecular and biological techniques.

### Product Performance Indicators

The **Viral DNA and RNA Extraction Kit** can extract more than 10 IU/mL viral DNA nucleic acid, and more than 30 IU/mL viral RNA nucleic acid. Both the intra and inter-batch variations of the kit are less than 5%.

### Special Notes

The **Viral DNA and RNA Extraction Kit** is worked with TIANLONG® automated nucleic acid extractors (Geneflex) that have been disinfected by UV light before use. After an experiment, wipe the inside of the extractor with 75% ethanol and disinfect it with UV light for 15 mins. An automatic nucleic acid extractor automates the entire purification process and can process 1-16 samples in a single run.

The **Viral DNA and RNA Extraction Kit** is used to extract viral DNA and RNA targets. To avoid RNA degradation by RNase during operation, use exclusive-use utensils and sample injectors, and use disposable centrifuge tubes and tips processed by autoclave before using. The operator should wear powder-free gloves and a mask and a protective coverall.

The kit has magnetic beads with a unique separation function and buffer system to extract, separate and purify high-quality nucleic acids from whole blood, serum, plasma, interstitial fluid, urine, and swab samples.

Magnetic beads enable the purification of high-quality nucleic acids that are free of protein, nuclease, and other impurities. Purified nucleic acids can be widely used in a variety of routine operations, including experiments such as enzyme digestion, Polymerase Chain Reaction (PCR), DNA library construction, Southern hybridization and blotting.

Please carefully read the manual of instructions before attempting to install or use the product for the first time. To consider all possible consequences of incorrect operation or non-recommended functions, pay special attention to the possible consequences.

### Testing Principle

The **Viral DNA and RNA Extraction Kit** is worked with TIANLONG® automated nucleic acid extractors (Geneflex). During the nucleic acid extraction process, magnetic beads are adsorbed, transferred and released by special magnetic rods based on the principle of magnetic bead adsorption. The extraction process enables the conduction of nucleic acid extraction and final adsorption of highly pure nucleic acids with the transfer of magnetic beads and nucleic acids.

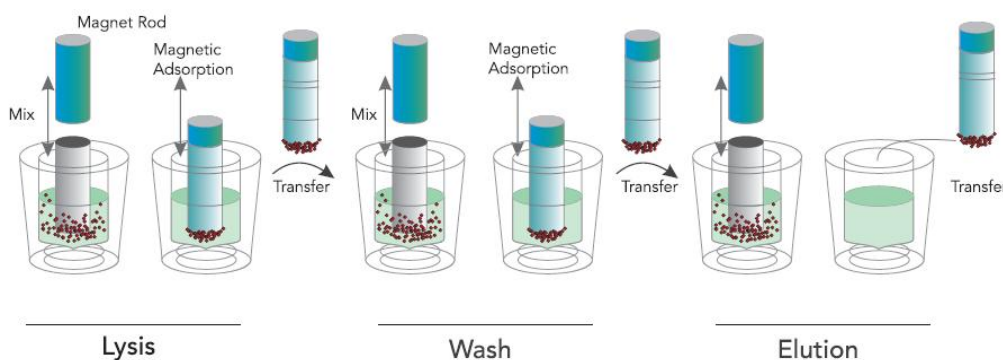


Figure 1. Schematic Diagram of Automatic Nucleic Acid Extractor

**An automatic nucleic acid extractor performs the following steps on a sample which contains magnetic particles:**

A magnetic rod protected by the mixing sleeve inserts into a well which contains sample. The mixing **Viral DNA and RNA Extraction Kit (T338H) –User Guide**

sleeve stirs rapidly and repeatedly in the liquid to ensure complete mixing of the liquid and magnetic beads. After cell lysis, nucleic acid adsorption, washing and elution, highly pure nucleic acid is obtained. GeneFlex is equipped with an array of 16 magnetic rods, allowing it to process up to 16 samples simultaneously.

## Kit Contents

| Name of Component     |                         | Short Code | T338H                            |
|-----------------------|-------------------------|------------|----------------------------------|
| Pre-filled Reagent    | Size                    |            | 64T/Box (Pre-filled)             |
|                       | Component               |            | Pre-filled<br>96-deep well plate |
|                       | Quantity                |            | 4                                |
|                       | Component Specification |            | 16 Tests                         |
| Proteinase K Solution | Component               |            | 1.28 mL                          |
|                       | Specification           |            |                                  |
|                       | Quantity                |            | 1                                |
| Instructions for Use  |                         |            | 1 Copy                           |

## Materials Required but not Provided

When working in a laboratory, make sure to wear a proper lab coat, powder-free disposable gloves and protective goggles. For more information, please consult the Safety Data Sheet (SDS) available from the product supplier.

- Pipettor: 20µL or 200µL
- Tip: 20µL or 200µL
- Vortex Mixer
- Sample Holder
- 75% Ethanol

## Warnings and Precautions

**Please be sure to read the precautions before using the kit.**

The **Viral DNA and RNA Extraction Kit** is used to extract viral DNA and RNA targets. To avoid RNA degradation by RNase during operation, use exclusive-use utensils and sample injectors, and use disposable centrifuge tubes and tips processed by autoclave before using. The operator (researcher or clinical expert) should wear powder-free gloves and a mask.

Please read the manual carefully before using the kit, and strictly follow the manual throughout the operation. The clinical samples should be collected on a clean bench or in a bio-safety cabin.

Before using TIANLONG® automated nucleic acid extractors (GeneFlex), they must be disinfected by UV light. After an experiment, wipe the inside of the extractor with 75% ethanol and disinfect it with UV light for 15 minutes.

Due to the possibility of residual magnetic beads in the eluate following extraction, every possible effort should be made to avoid suctioning of any magnetic beads during eluate absorption.

Do not mix reagents from different batches, and use the kit within expiry date.

Dispose of all samples and reagent materials used in an experiment, and thoroughly clean and disinfect the experimental workbench.

The **Viral DNA and RNA Extraction Kit** is intended for in vitro diagnosis use.

When using kit, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, please consult the appropriate Material Safety Data Sheets (MSDSs). These documents are available online in a convenient and compact PDF format at <https://www.ug-msds.com/MSDS1>, where the operator can find, view and print the appropriate MSDSs.



**Caution: Do not add any bleach or acidic solution directly to the pre-filled reagent.**

The pre-filled reagent contains guanidinium salts, which, when combined with bleach can form highly reactive compounds. If any of buffers are spilled, clean immediately with a suitable laboratory detergent and water. If the spilled liquid contains potentially infectious agents, clean the affected area first with laboratory detergent and water first. Then clean with sodium hypochlorite at a concentration of 1% (v/v). The **Viral DNA and RNA Extraction Kit** comes with the following warnings and precautions.

● **Product contents**

Guanidine hydrochloride, sodium dodecyl sulfate, trihydroxymethyl aminomethane, isopropanol, absolute ethanol.

● **Toxicological information**

**Skin corrosion/irritation**

May irritate the skin.

**Severe eye damage/eye irritation**

May cause irreversible eye damage.

**Respiratory or dermal sensitivity**

No relevant data is available.

**Germ cell mutagenesis**

Do not conform with the classification criteria based on the existing data.

**Carcinogenicity**

Do not conform with the classification criteria based on the existing data.

**Reproductive toxicity**

Do not conform with the classification criteria based on the existing data.

**Specific target organ toxicity - single exposure**

May cause drowsiness or dizziness.

**Specific target organ toxicity - repeated exposure**

Do not conform with the classification criteria based on the existing data.

**Potential health effects**

Inhalation: Avoid inhalation of concentrated vapour. Inhaling a large amount of vapour may cause respiratory irritation. May cause drowsiness or dizziness.

Skin contact: May cause skin irritation.

Eye contact: Liquid contact may cause eye damage.

Ingestion: For any unexpected route of exposure, it may be harmful if ingested.

● **Ecological Information**

Ecotoxicity: Harmful to aquatic life with long-lasting effects.

Mobility: No relevant data is available.

Bioaccumulation potential: No relevant data is available.

Environmentally adverse effects: No relevant data is available.

Other adverse effects: Do not allow the product to enter drains or water sources.

● **First aid measures**

In case of eye contact: Immediately rinse the upper and lower eyelids with plenty of water.

In case of skin contact: Immediately remove contaminated clothing thoroughly, rinse the skin with soap and plenty of water. If irritation persists, immediately contact the nearest doctor/physician.

In case of inhalation: Keep away from exposure and transfer to a place with fresh air.

In case of ingestion: Do not give anything orally to an unconscious person. Rinse mouth thoroughly with water and seek immediate medical attention for symptomatic treatment.



## Precaution for Safe Handling

Do not dispose of the preparation or the packaging waste in drains leading to the sewage system or in the drainage system for waste not produced by industrial/analysis waste.

Any material in contact with reagents should be treated as a biological contaminant and treated in accordance with relevant local regulations.

## Reagent Storage and Handling

The **Viral DNA and RNA Extraction Kit** should be stored at room temperature in a cool, dry and well-ventilated area. All components of the kit can be adequately stored for 12 months.

The kit should be used in a well-ventilated area, keep away from the source of heat, sparks, open flames, and smoking.

To avoid evaporation, the pre-filled reagent should be used immediately after opening, and should not be placed for a long period of time.

Avoid exposure to UV light (e.g., for decontamination), which may result in accelerated aging.

## Sample Handling and Storage

Avoid foam inside or on the samples. Depending on the starting material, sample pre-treatment may be required. Samples should be stored at room temperature (15~25°C) before starting the experiment.

Samples should be used immediately after collection to extract nucleic acid or stored at 2~8°C for further experiment within 24 hours. For long-term storage, the samples should be placed at -20°C.

## Operation Guide

### 1. Automated Extraction Process

Automatic nucleic acid extractor (GeneFlex) enable nucleic acid extraction by magnetic beads. They use magnetic rods to move the beads adsorbed with nucleic acid into different reagent wells. Magnetic rod protected by the mixing sleeve which stirs rapidly and repeatedly in the liquid to ensure complete mixing of the liquid and magnetic beads. After cell lysis, nucleic acid adsorption, washing, and elution, the highly pure nucleic acids are obtained. Automatic nucleic acid extractors are characterized by high automation, rapid extraction speed, stable results, and ease of operation.

The user needs to load samples and magnetic bead nucleic acid extraction reagents into the reaction consumables, the nucleic acid extractors are going to perform all nucleic acid extractions according to the experimental procedures. Please refer to the user manual provided with the respective instruments for operating instruction and start-up of tests.

### 2. Operation Steps of Automated Extraction

#### 2.1 Automatic Nucleic Acid Extractor (model: GeneFlex)

##### 2.1.1 Edit Experiment Program

The extraction procedure of Libex Nucleic Acid Extractor is as follows:

| Step | Name        | Well | Stir (min:s) | Magnetic (min:s) | Wait (min:s) | Speed (rpm) | Volume (μL) | T Control (°C) |
|------|-------------|------|--------------|------------------|--------------|-------------|-------------|----------------|
| 1    | Remove bead | 1    | 00:10        | 00:20            | 00:00        | 2500        | 625         | 0              |
| 2    | Lysis       | 2    | 05:00        | 00:45            | 00:00        | 2000        | 800         | 60             |
| 3    | Washing 1   | 3    | 01:00        | 00:00            | 00:00        | 1500        | 650         | 80             |
| 4    | Washing 1   | 3    | 01:00        | 00:30            | 00:00        | 2000        | 650         | 80             |
| 5    | Washing 2   | 4    | 00:30        | 00:00            | 00:00        | 1500        | 700         | 80             |
| 6    | Washing 2   | 4    | 00:30        | 00:20            | 00:00        | 2000        | 700         | 80             |
| 7    | Washing 3   | 6    | 00:30        | 00:00            | 00:00        | 1500        | 800         | 80             |
| 8    | Washing 3   | 6    | 00:30        | 00:20            | 01:00        | 2000        | 800         | 80             |
| 9    | Elution     | 5    | 05:00        | 00:35            | 00:00        | 2000        | 70          | 70             |

##### 2.1.2 Reagent preparation

96-deep well plate:

Open the kit and take out the pre-filled reagent from the plastic package, slowly invert it several times to resuspend the magnetic beads. Gently shake the 96-well plate so that the reagent and magnetic beads are concentrated on the bottom of the 96-well plate (A 96-well plate horizontal centrifuge can also be used for centrifugation at 500rpm for 1min). Carefully tear off the aluminum foil sealing film before use to avoid liquid splashing.

### 2.1.3 Adding Sample to the Reagent

96-deep well plate:

Add 20 $\mu$ L Proteinase K solution and 200 $\mu$ L sample to column 2 or column 8 of the pre-filled reagent respectively. (Be aware of the column No. is for effective wells).

**⚠ Caution:** When pipetting the sample, avoid having substance than liquid adhere to the tip of the sample injector; do not add the sample too quickly to avoid contaminating the upper portion of the well wall; and do not splash air bubbles to avoid contaminating adjacent wells.

**ⓘ Note:** The following points should be taken into consideration when determining whether a sample is suitable for The Viral DNA and RNA Extraction Kit.

a. Type of sample: whole blood, serum, plasma, interstitial fluid, urine and swab etc.

b. Sample storage: Immediate extraction or keep at 2~8 $^{\circ}$ C for later use, the storage period should not exceed 24 hours. Long-term storage should be under -20 $^{\circ}$ C.

### 2.1.4 Loading in deep well plate

Properly position the 96-deep well plate containing the sample in the sample in the experimental cabin of the fully automatic nucleic acid extractor (GeneFlex).

**ⓘ Note:** The user should ensure the marked notch of the plate faces front, which is shown in Figure 2 .

Insert the rotatory mixing sleeve into column 1 and column 7 of the deep well plate and close the experimental cabin

**⚠ Caution:** The user must ensure that the rotatory mixing sleeve is placed properly. Otherwise, the instrument may operate abnormally, or the magnetic rods may be contaminated.

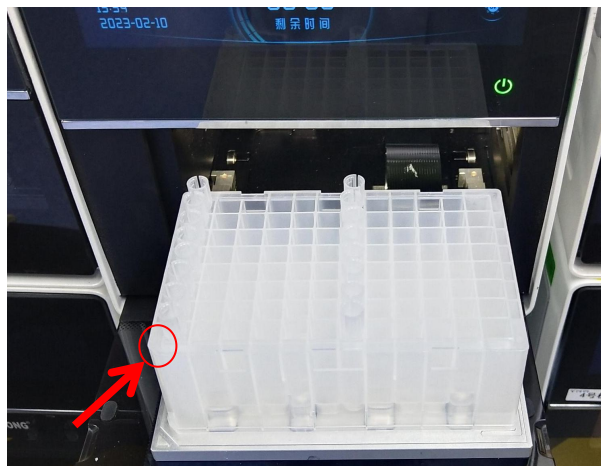


Figure 2. 96-deep well plate

### 2.1.5 Experimental procedure run

For special operations please see 2.1.1. After the procedure is completed, the instrument will notice the user the experiment has been completed. Transfer the extracted product from 5 and column 11 to a clean centrifuge tube which is free of nuclease.

**ⓘ Note:** If the user does not analyse the extracted product immediately, please seal and store in a refrigerator at -20 $^{\circ}$ C.

**⚠ Caution:** Any used deep well plate and mixing sleeve should be considered as biological contaminants and disposed of in accordance with relevant regulations.

**⚠ Caution: Using expired reagents or those that are not compatible with this instrument does not guarantee expected results.**

### 2.1.6 Cleaning and maintenance of the instrument

Follow the Cleaning and Maintenance of Instrument in accordance with the user manual provided with the equipment. Ensure that the experimental cabin is cleaned regularly to minimize the risk of cross-contamination.

## Troubleshooting Guide

This troubleshooting guide should assist you in resolving any problems that arise during the experimental process. For more information, please visit our Technical Support Centre and Frequently Asked Questions, page at: <http://www.medtl.net>. The scientists in our Tianlong company's Technical Services Department are always available to answer any questions you may have about the information and protocols contained in the manual, as well as sample and assay technologies (for contact information is included on the back cover or at: <http://www.medtl.net>).

When an exception or error occurs during the experiment, the current run step is terminated/stopped. After resolving the error or exception, restart the run from the beginning. The troubleshooting guide is shown in the following table.

| No. | Fault Symptom  | Fault Cause   | Handling Method   |
|-----|--|---|---|
| 1   | The well plate vibrates and the liquid splashes when tearing off the aluminum foil sealing film. | When tearing the film, please press the well plate to prevent it from rocking | The reagent for this plate shall be scrapped, and re-extraction shall be performed. |
| 2   | Add the sample to unexpected wells.  | Please read this manual carefully before adding samples.                      | The reagent for this plate shall be scrapped, and re-extraction shall be performed. |
| 3   | The amount of liquid in the reagent wells is insufficient  | /   | Contact the after-sales service of our company.                                     |
| 4   | Reuse of pre-filled components   | Please read the precautions in this manual before using the kit.              | Perform re-extraction of nucleic acid.  |
| 5   | Abnormal noise from the instrument during extraction   | The 96-deep well plate may be placed incorrectly.                             | Reposition the deep well plate.   |
|     |  | The mixing sleeve may not be inserted in place.                               | Reinsert the mixing sleeve.   |
| 6   | Poor extraction performance  | Please follow the operation requirements in the manual                        | Contact the after-sales service of our company.                                     |
|     |  | The temperature control components of the instrument may be abnormal.         | Contact the after-sales service of our company.                                     |



|  |  |       |   |
|--|--|-------|---|
|  |  | Other | Contact the after-sales service of our company. |
|--|--|-------|---|

\* Ensure that the reagents have been preserved and used according to the manufacturer's instructions.

## Quality Control

In accordance with Tianlong Company's ISO-certified Quality Management, each lot of **Viral DNA and RNA Extraction Kit** is tested against predetermined specifications to ensure consistent product quality.

## Limitations of Test Methods













The system performance has been established through performance evaluation studies using whole blood, serum, plasma, interstitial fluid, urine and swab samples to purify viral DNA and RNA.

It is the user's responsibility to validate system performance for any procedures used in their laboratory that are not covered by the performance evaluation studies of Xi'an Tianlong Science and Technology Co., Ltd.

Although the kit is intended for use in public health and scientific research, the purity and quality of extraction results are also affected by the testing instruments and personnel. Moreover, the kit uses a specially formulated eluent that can affect the absorbance value, so it is not recommended to use a UV rays spectrophotometer to measure the extraction effect directly.

The extraction kit is intended for use with clinical diagnostic samples, forensic materials, and scientific research samples. The instrument and operator have an effect on the concentration and purity of the extracted product. Any generated diagnostic results must be interpreted in conjunction with the other clinical or laboratory findings.

## Safety Symbols and Signs

| No. | Symbol  | Implication   |
|-----|---|---|
| 1   |  | Catalogue number                                    |
| 2   |  | Batch code  |
| 3   |  | Contains sufficient for <N> tests                   |
| 4   |  | Use by date   |
| 5   |  | Caution   |
| 6   |  | Temperature limit                                   |
| 7   |  | In vitro diagnostic medical device                  |
| 8   |  | Reminder  |
| 9   |  | Manufacturer  |
| 10  |  | Do not re-use                                       |
| 11  |  | Conformed with EU standard                          |
| 12  |  | Authorized representative in the European Community |

## Contact Information

For technical assistance and more information, please contact our Technical Support Center at +86-29-82218051 (Tel), +86-29-82216680 (Fax), [www.medtl.net](http://www.medtl.net) or contact your local distributor.

For up-to-date licensing information or product-specific disclaimers, please see the respective User Guide. Tianlong User Guides are available at [www.medtl.net](http://www.medtl.net) or can be requested from Tianlong Technical Services or the local distributor.

IFU\_T338H\_EN © 2023 Xi'an Tianlong Science and Technology Co., Ltd., all rights reserved.