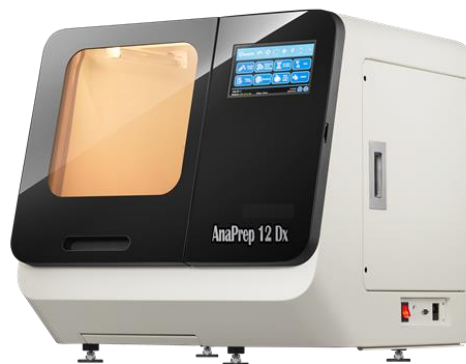


# **Instruction Manual**

## **AnaPrep 12 Dx**

### **Automated Nucleic Acid Preparation System**



Catalog No.: Z2111001

Rev. Date: Jan 15, 2021

Manual No. QW-IH01-06

Version: Z2111001UA

For General Laboratory Use Only





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## Introduction

Thank you for purchasing the AnaPrep 12 Dx system which is a fully automated, standalone robot that can purify nucleic acids within 30-45 minutes. With advanced magnetic bead separation technology, it enables you to obtain high-quality extraction results. Moreover, the most user-friendly interface makes users free from troublesome parameter settings and maintenance.

This guide contains important information regarding the safe use of the AnaPrep 12 Dx system. Please read this manual carefully before you start to run the system for the first time, especially for Safety Information.

If there is any question about how to install or operate the system, please contact our technical support center (techsupport@biochain.com).

### Contact Info:

|          |  |
|----------|--|
| Company: | BioChain Institute Inc.                                  |
| Address: | 39600 Eureka Dr.<br>Newark, CA 94560, USA                |
| Tel:     | 1-510-783-8588   |
| Fax:     | 1-510-783-5386   |
| Mail:    | <a href="mailto:info@biochain.com">info@biochain.com</a> |

## AnaPrep Magnetic Bead Purification Process





## Safety Information

The meaning of safety precaution marks are as follows:

### **WARNING:**

"WARNING" indicates a dangerous condition that may lead to death or serious injury.



### **BIOHAZARD:**

This symbol indicates that certain precautions must be taken when working with potentially infectious material.



### **CAUTION:**

This symbol indicates that non-compliance with instructions or procedures may lead to physical injury or even death or could cause damage to the instrument.

### **Important:**

"Important" points an important note for appropriate usage, as well as prohibited actions.

### **Note:**

"Note" indicates the procedures that should be obeyed and supplementary information for use.



### **HOT SURFACE:**

This symbol labels potentially hot surfaces on the instrument.



## **About Instrument**

### **WARNING:**

- Ignoring the following notations may lead to fire or electric shock.
  - In countries other than Taiwan, US and Canada, use a power cable that meets your country's standard or contact your local distributor.
  - Do not use the AnaPrep 12 Dx system with the voltage other than the voltage specified on the device.
  - Do not use the AnaPrep 12 Dx system with a damaged power plug or a loose socket.
  - If there is dust on the prongs of the power plug or on the plug socket, remove it with a dry cloth.
  - When you disconnect the plug from the outlet, be sure to hold the power plug itself. Do not pull the power cable.
  - For maintenance, disconnect the power plug from the outlet.
  - Do not touch the power plug when you hear the crash of thunder.
- Do not pour any liquid on the AnaPrep 12 Dx system.
- Do not place any objects containing liquid on the AnaPrep 12 Dx system. Doing so may cause device failure, fire, or electric shock.
- If the device starts to smoke or smells strange, immediately unplug the power cable.



### **CAUTION:**

- Never attempt to remodel the AnaPrep 12 Dx system without the manufacturer's permission. Doing so may cause fire or electric shock.
- Do not place or drop objects on the AnaPrep 12 Dx system. Also refrain from bumping or knocking it, as doing so may cause a failure or malfunction of the AnaPrep 12 Dx system.
- If any liquid materials are left inside the device, wipe it up with a soft paper tissue, etc.



Otherwise, the AnaPrep 12 Dx system may be damaged.

- Repairs to the AnaPrep 12 Dx system should only be performed by such agencies as are specifically authorized by the BioChain Institute Inc.
- Only original AnaPrep 12 Dx replacement parts should be used.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## **About Reagent Kits**



### **CAUTION:**

- When handling any of the kits, refer to the respective handbook.
- Reagents in each kit should be handled by observing the safety information and precautions regarding the kit.
- Extraction should be performed in an appropriate laboratory or workplace.

### **Note:**

- The kits are not supplied with the AnaPrep 12 Dx system. Select the desired kit(s) and order it (them) separately.



## **About Samples**



### **BIOHAZARD:**

- Always wear appropriate gloves, a mask, and safety goggles, etc. when handling any infectious samples.

## **About Infectious Wastes**

- When handling or disposing of infectious materials, follow the laboratory guideline or the law regarding infectious waste to perform proper incineration, fusion, sterilization, and/or disinfection.
- When you use a third-party company to dispose of wastes, outsource this work to an operator licensed to handle medical waste subject to special control, and give them the medical waste manifest at the same time.

## **BioChain Service Center**

- For technical problem and instrument maintenance please contact our service center:

BioChain Institute Inc.  
39600 Eureka Dr.  
Newark, CA 94560, USA  
1-510-783-8588  
1-510-783-5386  
[techsupport@biochain.com](mailto:techsupport@biochain.com)








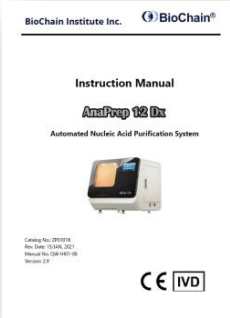

# 1.0 Installation

## 1.1 Composition of the AnaPrep 12 Dx system

Check that the following items are included in the package. Contact your local representative if you notice any missing part(s).



**Caution:** Please note that the sample rack should only be used with this device.

|  |   |   |  |
|--|---|---|--|
| <p>A. AnaPrep 12 Dx X 1</p>                           | <p>B. Power Cord X 1</p>     | <p>C. Sample Rack X 1 (1.5ml)*</p>  | <p>D. Barcode Reader X 1</p>  |
| <p>E. SD card<br/>(16GB X 1+32GB X 1 or above)</p>  | <p>E. User Manual X 1</p>  | <p>G. Fuse X 3 (1A,2A,4A)</p>     |  |

### Caution:

**“TURN OFF POWER BEFORE PICKING UP AND INSERTING SD CARD”**

To insert the Un-locked SD card in right direction

Please make sure all the components are free from damages as soon as you get the system. If any damage is found, please contact your local representative for instant support.

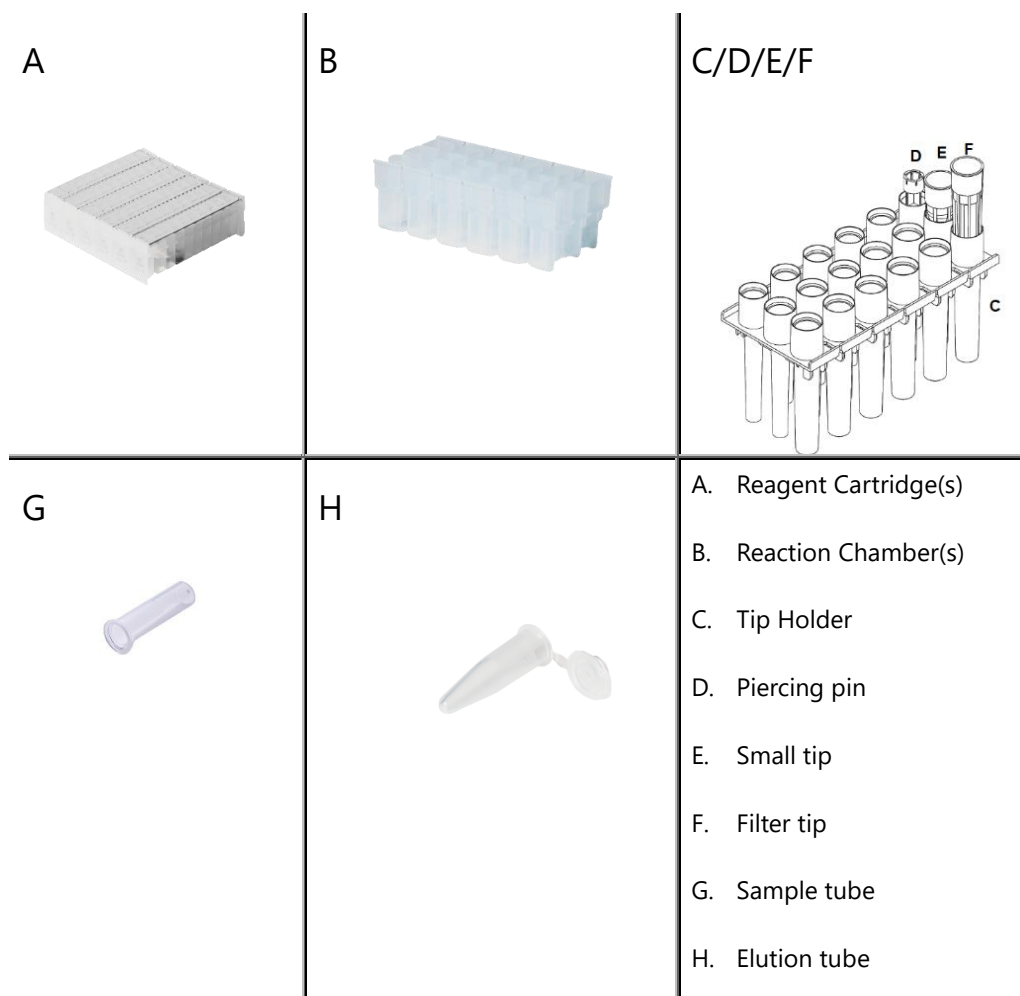




**Note:**

- BioChain's global warranty does not cover damages from transportation or improper operation.

## 1.2 Contents of Reagent Kits



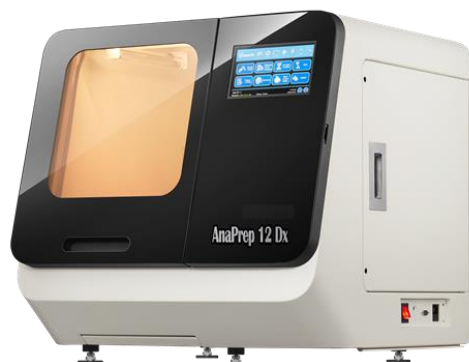
**Note:**

- Reagent kits are to be purchased separately. Please contact your local agents or representatives to get further info.
- The contents of reagent kits will vary. Refer to the handbook of kits enclosed in reagent box for details.



## 1.3 Operating Environment / Condition

Use the AnaPrep 12 Dx system in a location that meets the following conditions:



- The AnaPrep 12 Dx system must be placed at a minimum distance of 5-10 cm from all sidewalls to allow for good air circulation. The space for the allocation of the AnaPrep 12 Dx system must remain 5-10 cm from instrument to sidewalls.
- A location where power supply is provided safely.
- A location where the temperature ranges from 15 to 30°C and humidity ranges from 30% to 80% RH. (non-condensing)
- A location that is flat and stable, with no vibration.
- A location away from direct sunlight. (Block the sunlight by closing curtains or blinds as necessary)
- A location which is well-ventilated and not dusty.
- A location where the temperature does not go up and down suddenly. (Warming a cold room suddenly or moving the AnaPrep 12 Dx system from a room with low temperature to a warm room may cause condensation inside the device, resulting in abnormal extraction)
- A location where the temperature and humidity are kept within the specified range (far from water taps, water heaters, humidifiers, air-conditioners, and heaters)
- A location far from objects that generate strong magnetic fields. (motors,



transformers, TV, audio speakers, magnets, etc.) Bringing the AnaPrep 12 Dx system close to any type of magnetic field may cause a malfunction.

### **Warning:**

Do not use the AnaPrep 12 Dx system in a location where it is wet or can be splashed with water. It may cause device failure, fire, or electric shock.

When relocating the AnaPrep 12 Dx system, disconnect the plug from the outlet first. If the power cable is damaged, this may cause device failure, fire, injury, or electric shock.



### **Caution:**

Do not use the AnaPrep 12 Dx system in an unstable place such as a slanted surface or a place subject to vibrations. It may cause injury or device failure.

Do not use the AnaPrep 12 Dx system under direct sunlight or close to a heating device. It may shorten the life of the AnaPrep 12 Dx system, or cause malfunction.

Do not open the maintenance door while performing the experiment.

Do not open the front door while performing the experiment.

## **Operating Conditions**

| Items                   |                  | Conditions                  |
|-------------------------|------------------|-----------------------------|
| Temperature (°C)        | During operation | 15 – 30                     |
|                         | During downtime  | 0 – 55                      |
| Humidity % (RH)         | During operation | 30 – 80                     |
|                         | During downtime  | 10 – 80                     |
| Altitude, operating (m) |                  | Less than 2000 m (1008 hPa) |



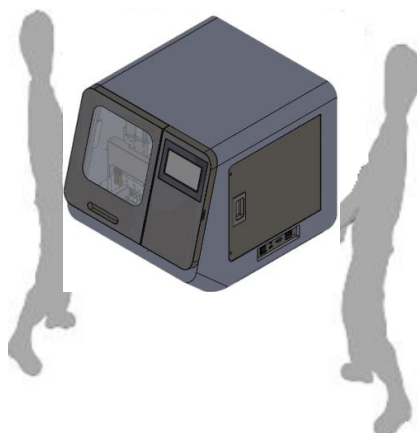
## 1.4 Unpack the AnaPrep 12 Dx system

Open the packing box and take out the instrument and related accessories.

### Important:

The AnaPrep 12 Dx system weights more than 70 kg. It should be lifted and moved by two persons.

Hold the moving handler of the instrument from two sides to move it out from the box. Handlers are located under the device, on the chassis' bottom.



- Do not hold the outer covering.
- Do not hold the front panel.
- Do not hold the door.

### Caution:

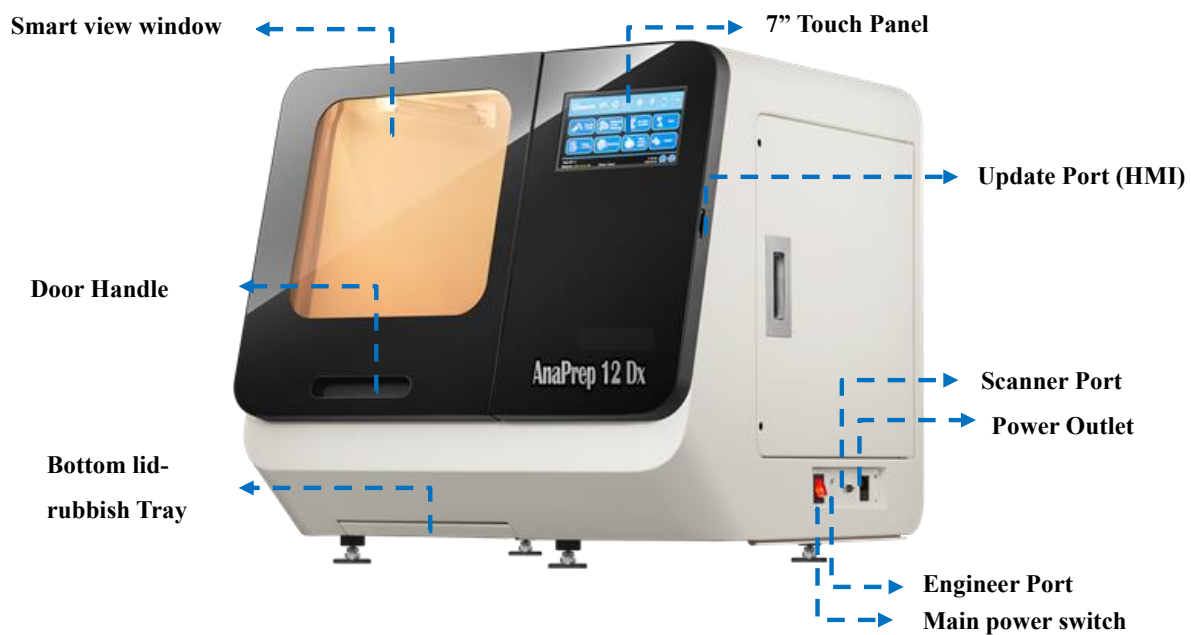
Improper AnaPrep 12 Dx system movement handling will lead to instrument damages.

For correct and safe use of the AnaPrep 12 Dx, install the device in a location close to the electrical outlet and that has enough space for installation and main switch operation.

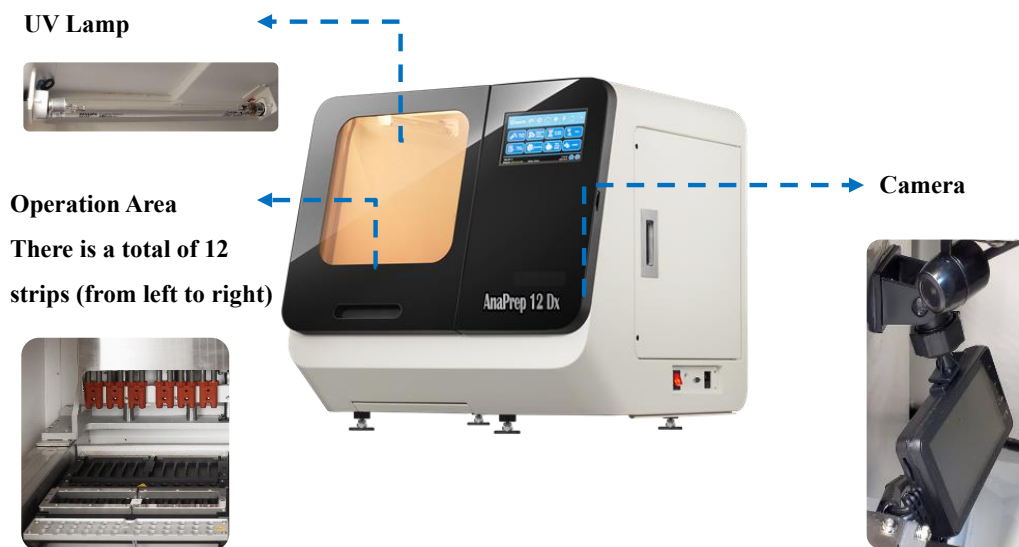


## 1.5 Overall View

### ■ Front view with Door closed

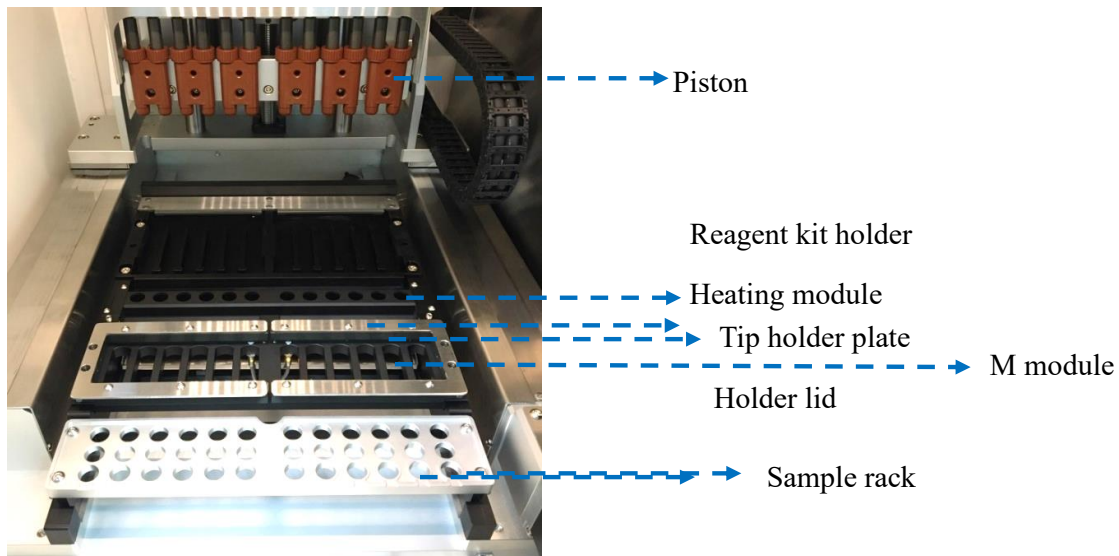


### ■ Front view with Door opened





■ Inside view





## 2.0 Getting Started



### Biohazard:

Always wear appropriate gloves, a mask, and safety goggles during any biohazardous operation during the extraction process. Even when touching the device after any operation with a biohazard risk, wear appropriate gloves and a mask since the device may be contaminated.

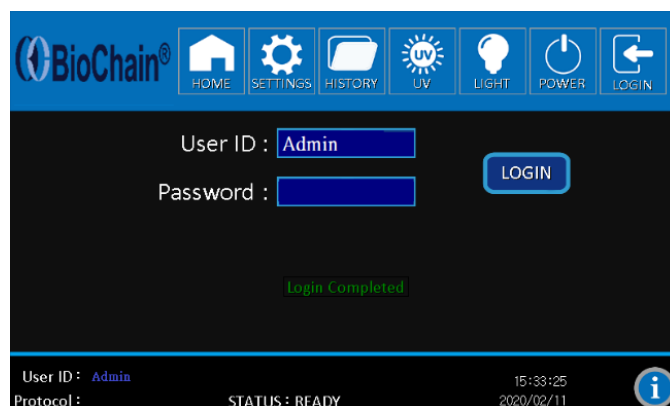
### Important:

Before starting extraction, put on appropriate gloves, a mask, and safety goggles if required by the operation. During the operation, from sample preparation to extraction completion, be careful not to expose the samples to foreign contaminants such as sweat, saliva, etc.

## 2.1 Turning ON the power

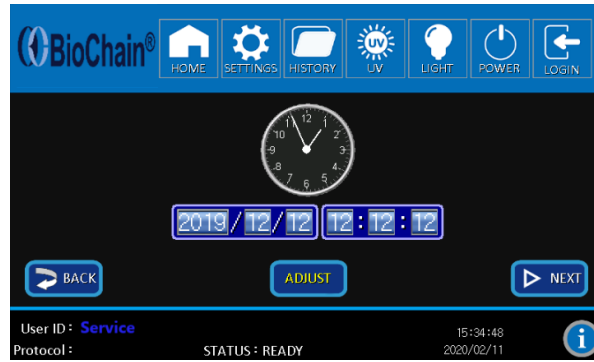
Follow the steps below to release the fixed part inside the instrument

- i. Plugin the power cord to the instrument and connect to the electric outlet.
- ii. Connect the barcode reader to instrument. Turn the power ON and log in with User ID ( Display will delay startup to read the SD card)  
"Admin" without password.

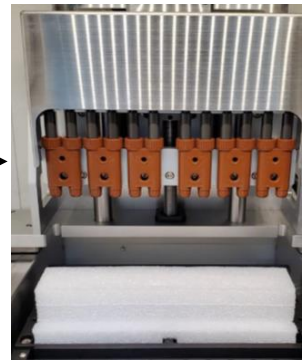
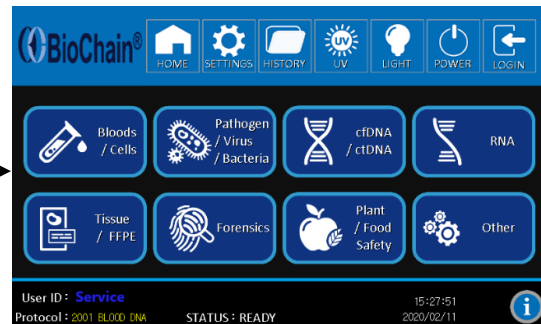
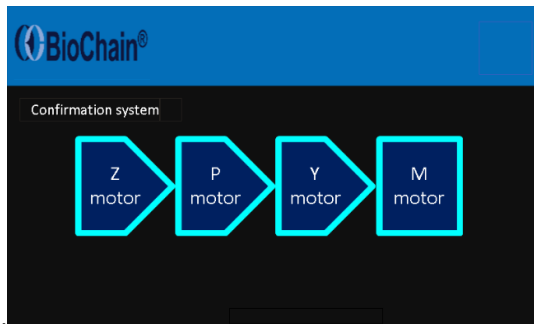


- iii. Set up the local time.



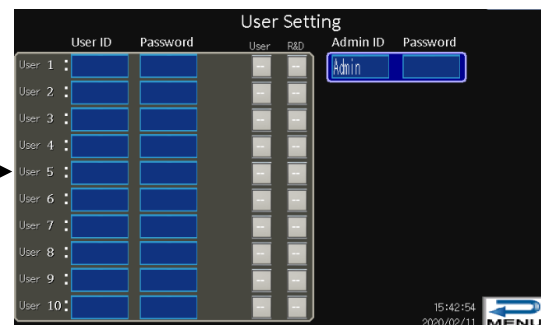
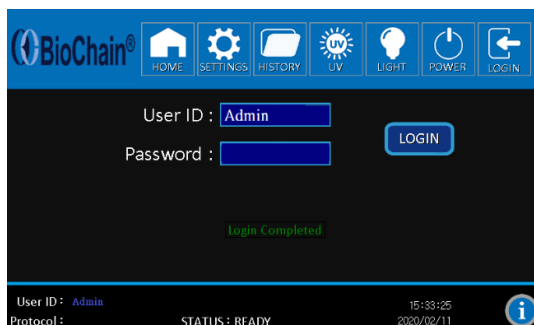


- iv. System will start to do the initialization and device will release transportation fixing parts automatically.



As an end user, please log in with User ID "Admin" (as end user/top authority in the laboratory) without password. You can set your Top authority "Admin" password to lock access to user to certain "Admin" options

- v. Once logged in, you will able to set up at least 10 other users with their own password.

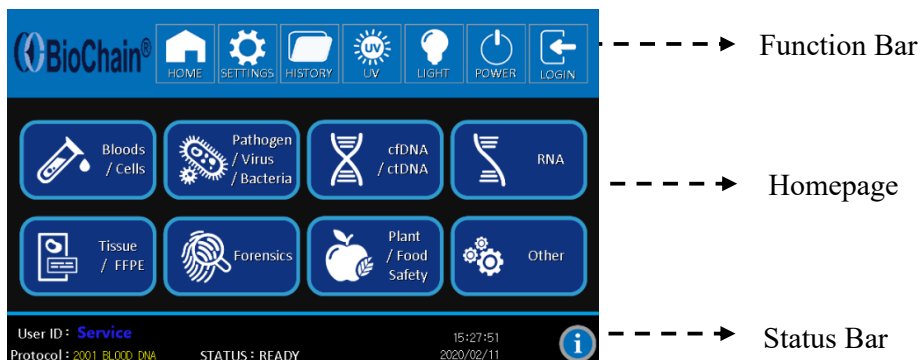




## Important:

Keep the shipping box and fixing block materials. They will be needed again when transporting the AnaPrep 12 Dx system.

## 2.2 Touch Panel and User Interface



## 2.3 Preparation


The following preparations are required for extraction operation.

- Gloves
- Mask
- Safety Goggles
- AnaPrep Kit

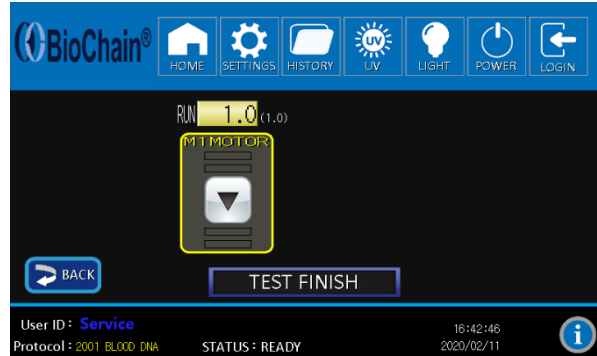
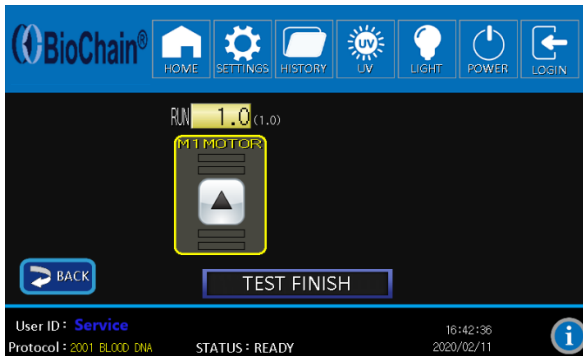
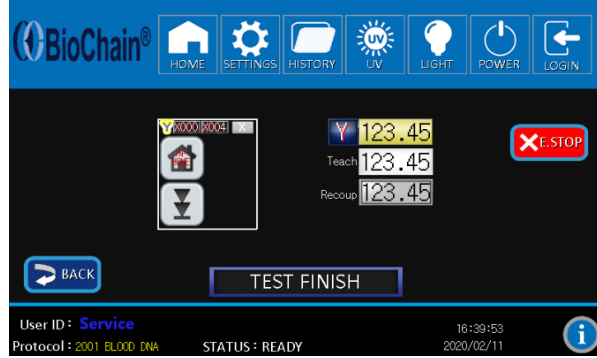
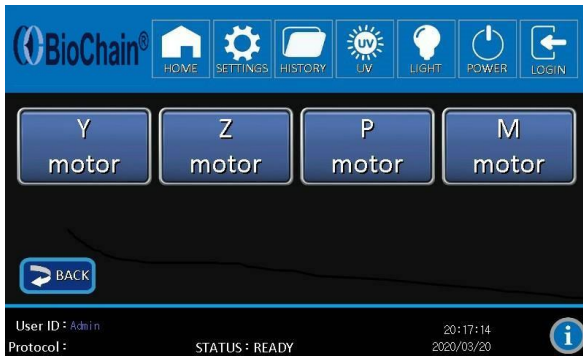
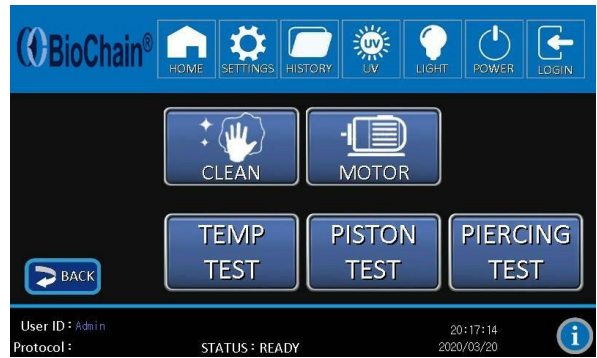
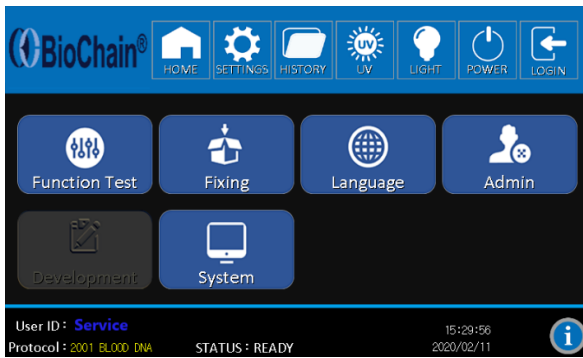
■ For Sample preparation, please refer to the handbook of each kit.

## 2.4 Function Test

Enter the settings menu → Function Test → MOTOR then check the position of each axis

(Y/Z/P/M). Select  then system will check the position automatically.

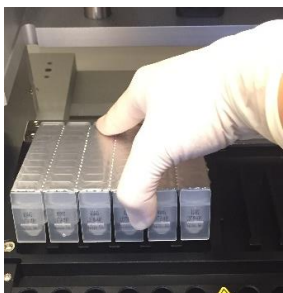






## 2.5 Extraction

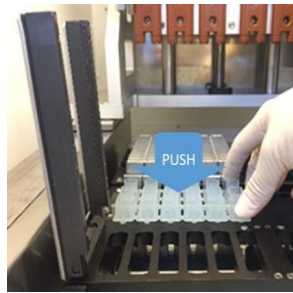
(1) Plastic consumable set up:



Insert the cartridges



Push down each cartridge  
(cartridges will “click”)



Insert Reaction Chambers  
(push down each well)



Insert Tip Holder



Close the tip holder lids



Insert Piercing Pins



Insert Filter tips



Stick the barcode label



Insert Sample Tube  
(On Sample Rack)



Insert Elution Tube  
(On Sample Rack)

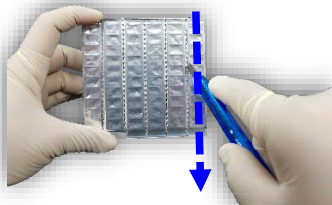


Load the sample(s)  
(To Sample Tube)



**Note:**

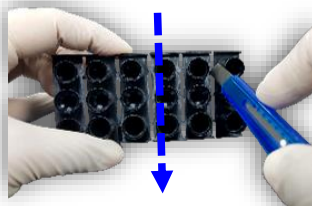
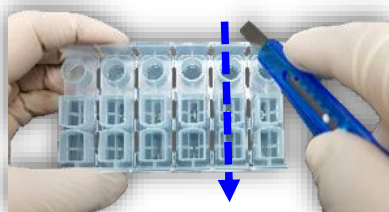
How to pull apart reagent cartridges strips: Slash open the dotted line with a cutter.



The position of piercing pins (on the right) and filter tips (on the left). The 2<sup>nd</sup> row in the middle should be EMPTY.



Use cutter or scissors **ONLY** if you are intending to separate the **Tip Holder / Reaction Chamber strips**.



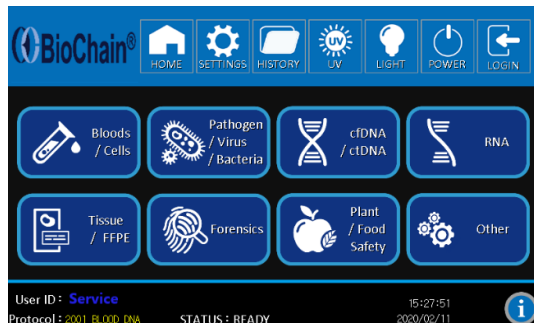
**Important:**

- Set Cartridges respecting the numbers order from left to right.
- Make sure that Cartridges are inserted into the Cartridge Tray tightly.
- You can load 1-12 strips on the tray depending on the number of samples you intend to process.

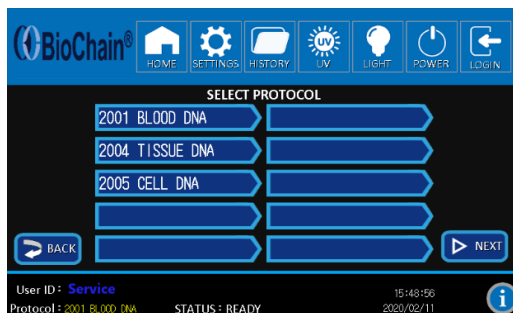
**(2) Start Program:**

(Please refer to System Status for operating information)

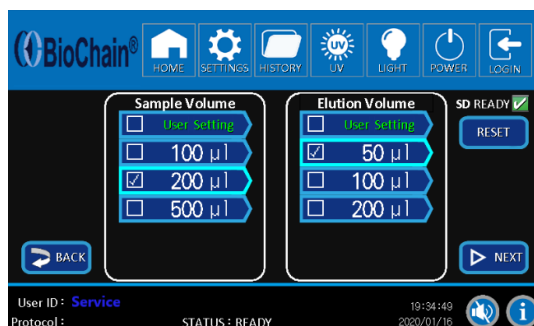




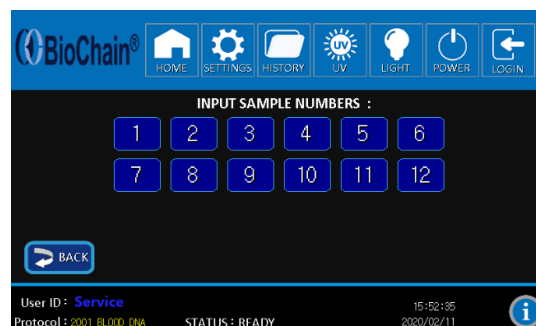
Select the desired targets from homepage



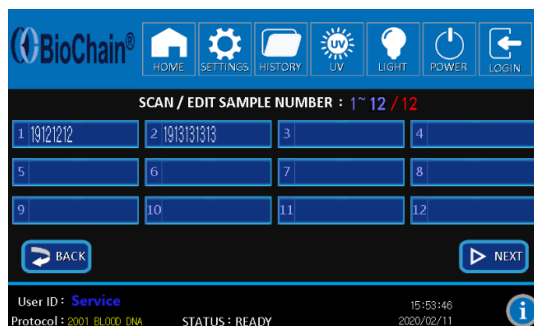
Select the Protocol then Press "NEXT"



Select Sample and Elution Volume then  
Press "NEXT"



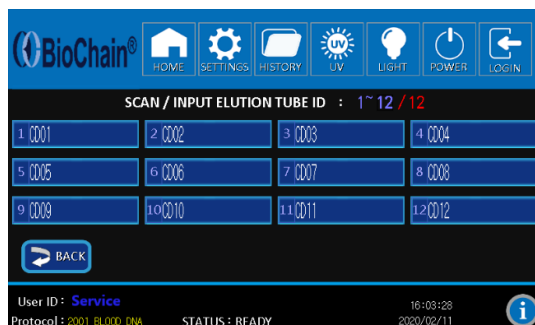
Select the Sample number then Press  
"NEXT"



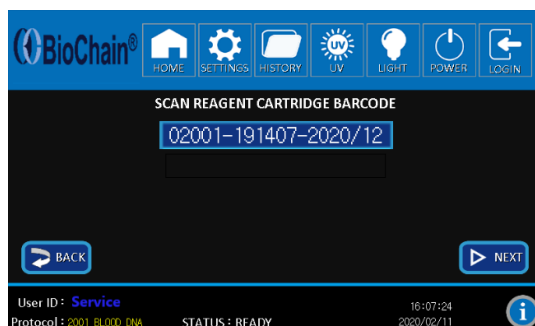
Edit the Sample ID then Press "NEXT"





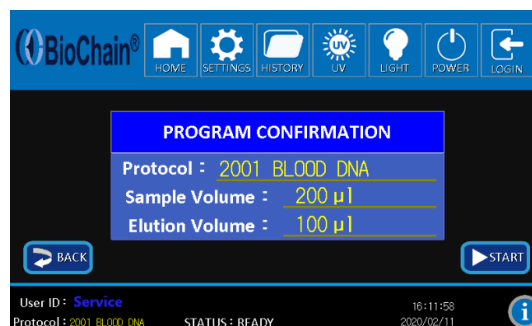


Edit the Elution ID then Press "NEXT"



Scan Reagent Cartridge Barcode then Press "NEXT"

BioChain does not guarantee expired kit performance. "Admin" & "Service" ID have to take responsibility for kit usage status.



System displays a consumable Checklist; Tick corresponding boxes then Press "NEXT". Note: The system will not allow user to go forward if not all consumable boxes are ticked. Add an Internal Control is optional.



**Note:**

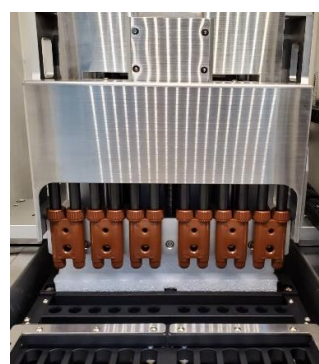
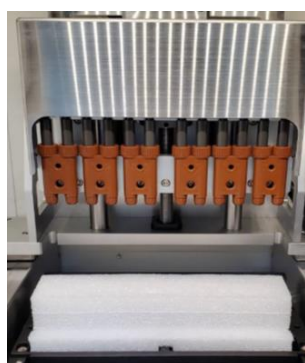
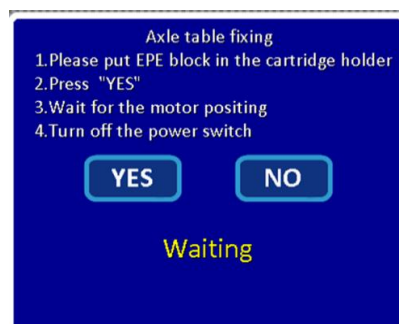
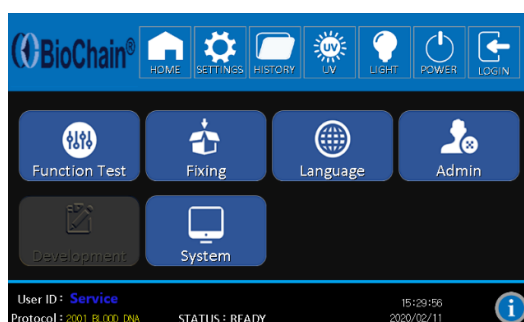
- To amend ID information: “DEL” wrong ID information → Scan right ID
- Pretreatments are essential for some sample types before loading to Sample Tube. Please refer to the handbook of reagent kits for details.
- Make sure the Sample Tray is placed correctly in the instrument
- Store the purified nucleic acids at 4°C for short-term storage or store at -70°C for long-term storage.

## 2.6 System fixing before transportation

(1) Enter to settings and select “Fixing”.

(Please refer to System Status for operating information)

(2) Put back the Fixing block at the Position of cartridge holder.





## 3.0 Cleaning & Maintaining the AnaPrep 12 Dx

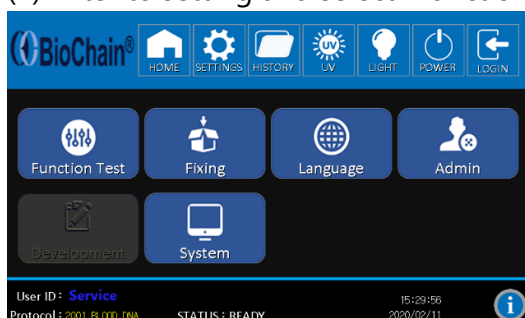


If samples or the buffers splash into the instrument, stop to clean as follows:

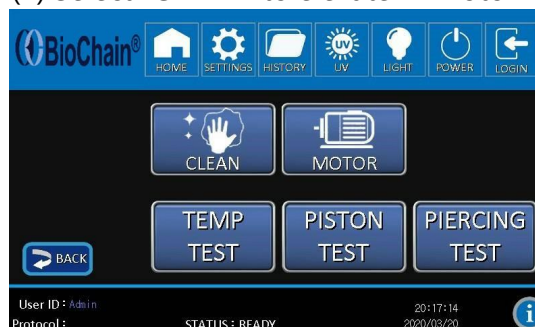
### 3.1 Cleaning of Rubbish Tray and M motor

To elevate M motor before cleaning of rubbish tray and M motor

(1) Enter to setting and select "Function Test"



(2) Select "CLEAN" to elevate M motor



(3) Clean rubbish tray and M motor with mild detergent and rinse with deionized water. Allow the parts to dry before use. Clean and disinfect the platform surface by wiping with deionized water followed by 75% ethanol.

(4) To restore M motor position click "FINISH" after cleaning

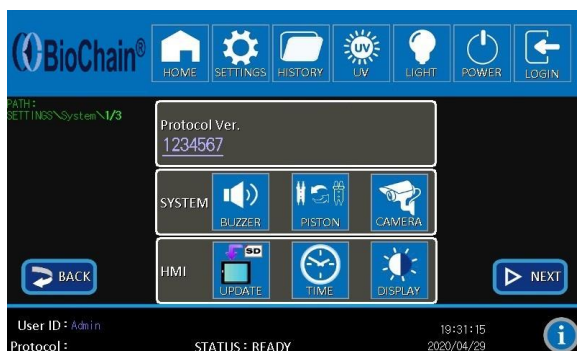


### 3.2 Cleaning of Piston

(1) Enter to "setting" and select "System",

(2) Clean piston (Red Square in image on next page) select "Piston" and use Kimwipes with 75% ETOH and change new piston if there is significant impurity stain or salt crystal.





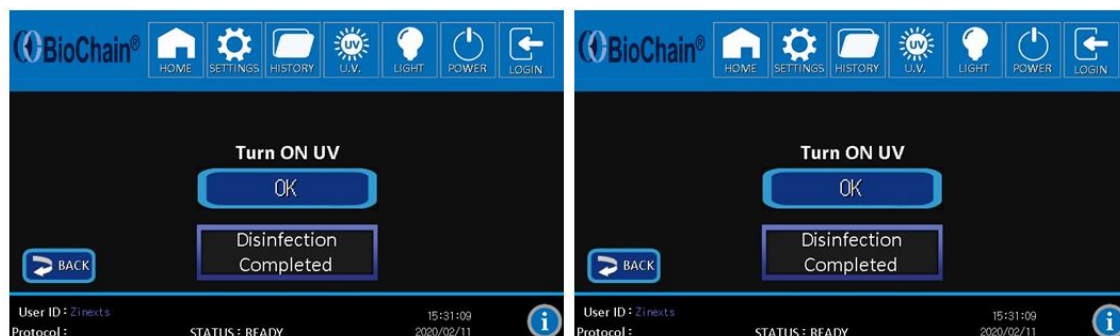
### 3.3 Routine and Preventive Maintenance

Two types of maintenance are to be performed on the AnaPrep 12 Dx system instrument as listed in the table. For details on each type of maintenance, see below:

| Schedule                     | Maintenance Type   | Performed by     |
|------------------------------|--|------------------|
| After each use               | Routine <ul style="list-style-type: none"> <li>■ Cleaning of sample Tray, M module, piston and holder lid by 75% EtOH.</li> <li>■ Cleaning of heating module and using cotton swab to check buffer residue in hold of heating module.</li> </ul>   | User             |
| Bi-weekly                    | <ul style="list-style-type: none"> <li>■ Check SD Memory space</li> <li>■ Cleaning of instrument body (outside)</li> <li>■ Cleaning of instrument body (inside)</li> </ul>   | User             |
| Two times a year or Annually | Preventive <ul style="list-style-type: none"> <li>■ Grease ball screws if required</li> <li>■ Check motor movement</li> <li>■ Check the air-tight status with piston units (using empty plastic wares and run )</li> <li>■ Cleaning of Piston</li> <li>■ UV light change annually</li> </ul> | Service Engineer |



## UV Light 30min



- Clean the Sample Tray and M motor with mild detergent and rinse with deionized water. Allow the parts to dry before use. Clean and disinfect the platform surface by wiping with deionized water followed by 75% ethanol.
- Clean the instrument body by removing dust gently with a dry, soft cloth. If the outside of the AnaPrep 12 Dx system is heavily soiled, or if any sample that may cause infection are adhering to the outside of the AnaPrep 12 Dx system, wipe with a soft paper tissue, soaked with 75% ethanol.



## 4.0 Troubleshooting

| Problem  | Cause  | Solution   |
|--|--|--|
| <b>Instrument Problems</b>   |  |  |
| No power (the LCM Screen remains blank when the power is turned on)                | AC power cord is not connected   | Check AC power cord connections at both ends. Or use the correct cords.  |
| LCM Screen turns ON when the power is ON but the self-testing program does not run | Forget to remove the packing elements from the instrument  | Turn off the instrument and remove the packing elements .  |
|  | Technical problem  | Contact your local representative or agent   |
| Protocol stops after an initial start  | Cartridge(s), Plastic wares (Reaction Chamber, Tip Holder, Filter tip, Sample Tube, Elute Tube) incorrectly loaded on the AnaPrep 12 Dx system | Turn off the power and then turn it on again to stop the program. The system will move back to the initial state. Re-load them according to the instructions shown in this manual.<br><br>Note: you cannot resume the protocol after stopping it, you may lose your samples.             |
|  | Problem with motion sensors  | Turn off the power and remove all samples and plastic wares. Contact your local representatives  |
| Bubbles form during extraction   | Improper adding of sample or sample volume is lower than the recommended volume  | Be sure to add the sample to tubes prior starting the protocol. To ensure proper mixing of reagents in the tip and prevent bubble formation during mixing, make sure the sample volume is at least the recommended volume listed in the handbook supplied with the AnaPrep Reagent Kits. |
| Presence of buffer in the Cartridge Tray   | Motor movements may not be smooth, incorrect placement of plasticware or leakage from tips   | Perform preventive maintenance annually to ensure proper motor movements.  |
| Leakage from Filter tip, Filter tips or uneven liquid handling between Filter tips | Air leakage on the Filter tip  | Swap the Tip with a new one  |
| Blockage of tips and   | Too much starting  | 1. Decrease the amount of starting material. Use the   |



|                   |   |   |
|-------------------|---|---|
| pipetting failure | material or excess DNA in sample causing clumps or aggregates | recommended amount of starting material as listed in the Reagent Kit manual (Handbook). |
|                   |   | 2. Suggest using blood kit 1200 instead of blood kit 200 (if test sample is blood)      |

| DNA Quality Problems                |   |   |
|-------------------------------------|---|---|
| Problem                             | Cause                                       | Solution  |
| Low DNA yield                       | Incomplete lysis                            | Decrease the amount of starting material used.  |
|                                     |   | Be sure to add Proteinase K during lysis, if included in the protocol.  |
|                                     |   | Make sure that the sample is completely immersed in the Lysis Buffer.   |
|                                     | Poor quality of starting material           | Be sure to process the sample immediately after collection or store the sample at the appropriate temperature. The yield and the quality of DNA isolated depend on the starting material.                           |
|                                     | Insufficient amount of magnetic beads added | During shipping, some magnetic bead solution may adhere to the sealing foil of the cartridge. To collect any bead solution from the foil, tap the cartridge to deposit the bead solution at the bottom of the well. |
|                                     | Clogged Tips resulting in DNA loss          | Ensure that the lysate does not contain any particulate material that can clog the tip sprout. If needed, centrifuge the sample prior to the AnaPrep purification.  |
| No DNA recovered                    | Magnetic beads stored or handled improperly | Store cartridge containing the beads at room temperature.   |
|                                     |   | Do not freeze the cartridge as the beads may be irreversibly damaged.   |
|                                     |   | Make sure that the beads are in solution at all times and do not dry. Dried beads are non-functional.   |
| Eluate containing DNA is discolored | Magnetic beads present in the eluate        | Remove any magnetic beads using a magnetic separator or centrifuge the sample in a microcentrifuge for 1 minute at maximum speed.   |
|                                     | DNA contaminated with heme                  | Minimize the amount of blood or blood-stained sample used ( $\leq 20\mu\text{l}$ blood spot for forensics sample).  |
| DNA is sheared or degraded          | Bubbles form during mixing steps            | To prevent bubble formation during mixing, make sure the sample volume is at least the recommended volume listed  |



|  |   |   |
|--|---|---|
|  |   | in the manual supplied with Reagent Kits.   |
|  | Purified DNA was repeatedly frozen and thawed | Aliquot purified DNA and store at 4°C (short-term) or -20°C (long-term). Avoid repeated freezing and thawing. |
|  | DNA contaminated with DNases                  | Maintain a sterile environment while working (i.e. wear gloves and use Dnase-free reagents).                  |

## 5.0 Specifications

|                                |  |
|--------------------------------|--|
| <b>Model</b>                   | AnaPrep 12 Dx  |
| <b>Instrument Type:</b>        | Benchtop automated nucleic acid extractor                |
| <b>Sample Processing:</b>      | 1 to 12 samples per batch                                |
| <b>Sample Volume Handling:</b> | 100 – 2000 µL  |
| <b>Processing Time:</b>        | See purification kit manual for details                  |
| <b>Heat Block Temperature:</b> | 60 °C to 70 °C (assuming the room temperature of ~25 °C) |
| <b>Protocol Input:</b>         | Touch Panel  |
| <b>UV Light</b>                | 30 minutes @ 250 nm                                      |
| <b>Built-in Features:</b>      | 7" Touch Panel   |
| <b>Instrument Dimensions:</b>  | 62.3 cm W x 63.5 cm D x 60.9 cm H                        |
| <b>Weight:</b>                 | 70 kg  |
| <b>Input Power:</b>            | AC 100-240 V, 50/60 Hz, 350 VA                           |
| <b>Operating Temperature:</b>  | 15-30 °C   |
| <b>Operating Humidity:</b>     | 30-80 %  |
| <b>Fuse:</b>                   | F 5A 250 V   |

## UPS Specification

On-Line, 1.5kVA/1200W, Battery energy (Watt-hours): 440 Wh

## EMC

EN 61326-1:2013 (IEC 61326-1:2012), EN 61326-2-6:2013

## Safety

IEC/EN61010-1, IEC/EN 61010-2-101



## 6.0 Warranty

### Limited Warranty

BioChain warrants that each product described herein will be free from defects in materials and workman-ship for a period of 1 year from the date of delivery. BioChain agrees, as its sole responsibility under this limited warranty, and upon prompt notice of a defect, to repair or replace any product discovered to be defective within the warranty period.

Expendable items are not covered by this warranty. Warranty service may be obtained by contacting BioChain at the address stated in this book.

This limited warranty is not applicable to:

- (1) normal wear and tear;
- (2) abuse, unreasonable use, improper installation, mistreatment, or neglect;
- (3) damage caused by the equipment or system with which the product is used;
- (4) damage caused by modification or repair not made or authorized by BioChain;
- (5) Mishandling by logistics company;
- or (6) theft, vandalism, fire, water or other peril. Product may not be returned without proper authorization by BioChain.

Cost of transportation, removal, or reinstallation of the equipment will be paid by the purchaser. This warranty and the remedies set forth herein are exclusive and in lieu of all other express or implied (including any implied warranties of merchantability or fitness for a particular purpose), and no other representations or claims shall be binding on or obligate BioChain in any way. In no event will BioChain be liable for any special, incidental, or consequential damages resulting from use or malfunction of this product or the equipment or system with which it is used, loss of revenue, or cost of replacement goods. Some States do not allow limitations on the period of time an implied warranty lasts and/or the exclusion of limitation of special, incidental, or consequential damages, so the above limitations and/or exclusions or limitation of liability may not apply to you. This warranty gives you specific legal rights, and you may have rights which vary from state to state.



## BioChain Institute Inc



[www.biochain.com](http://www.biochain.com)

BioChain Institute Inc.  
39600 Eureka Dr.  
Newark, CA 94560, USA  
1-510-783-8588  
1-510-783-5386  
[techsupport@biochain.com](mailto:techsupport@biochain.com)