Ver 1.0

Handbook for

Exgene™ Forensic SV mini

DNA PURIFICATION HANDBOOK

GeneAll

Customer & Technical Support

Should you have any further questions, do not hesitate to contact us.

We appreciate your comments and advice.

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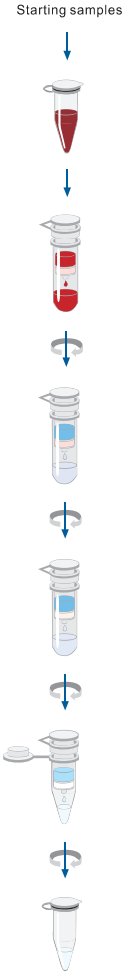
This protocol handbook is included in :

GeneAll® Exgene™ Forensic SV mini (122-101, 122-152)

Visit www.geneall.com for FAQ, Q&A and more information.

Brief protocol

Protocol for Tissue/Urine/Insect



1. Transfer the sample to a 1.5 ml microcentrifuge tube
2. Add 25 μl of Proteinase K solution and 300 μl of Buffer HL
3. Incubate for 30 min at 56°C
4. Centrifuge for 5 min at ≥13,000 rpm
   (for tissue and insect samples only!)

5. Transfer the supernatant to new 1.5 ml microcentrifuge tube
6. Add 300 μl of Buffer BL and 300 μl of Absolute Ethanol
7. Transfer the mixture into a mini column
8. Centrifuge for 2 min at 13,000 rpm
9. Repeat steps 7-8

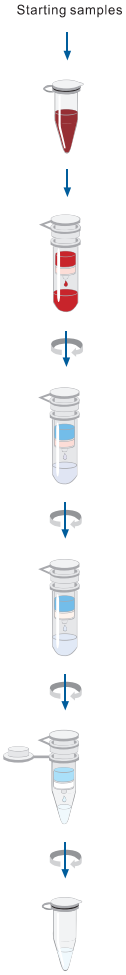
10. Add 600 μl of Buffer HW1 into the mini column
11. Centrifuge for 2 min at 13,000 rpm

12. Add 700 μl of Buffer HW2 into the mini column
13. Centrifuge for 2 minutes at 13,000 rpm
14. Perform an additional centrifuge for 3 min at ≥13,000 rpm

15. Apply 50-200 μl of Buffer AE into the mini column
16. Incubate for 2 min at room temperature
17. Centrifuge for 2 min at 13,000 rpm

Brief protocol

Protocol for Rib cartilage/Hair/Fingerprint tape/Cigarette butts



1. Transfer the sample to a 1.5 ml microcentrifuge tube
2. Add 25 μl of Proteinase K solution and 300 μl of Buffer HL
3. Incubate for 1 hour at 56°C

4. Add 300 μl of Buffer BL and 300 μl of Absolute Ethanol
5. Transfer the mixture into a mini column
6. Centrifuge for 2 min at 13,000 rpm
7. Repeat steps 5-6

8. Add 600 μl of Buffer HW1 into the mini column
9. Centrifuge for 2 min at 13,000 rpm

10. Add 700 μl of Buffer HW2 into the mini column
11. Centrifuge for 2 min at 13,000 rpm
12. Perform an additional centrifuge for 3 min at ≥ 13,000 rpm

13. Apply 30-100 μl of Buffer AE into the mini column
14. Incubate for 2 min at room temperature
15. Centrifuge for 2 min at 13,000 rpm

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Kit Contents

Cat. No.	122-101	122-152	Storage
Type	mini		
Components	Quantity		
No. of preparation	100	250	Room temperature (15~25°C)
Column Type G (mini) (with collection tube)	100	250	
2 ml collection tube	100	250	
Buffer HL	40 ml	90 ml	
Buffer BL	40 ml	80 ml	
Buffer HW1 (concentrate) *	36 ml	90 ml	
Buffer HW2 (concentrate) *	20 ml	50 ml	
Buffer AE	30 ml	60 ml	
PK Storage buffer	4 ml	9 ml	
Proteinase K **	60 mg	140 mg	
Protocol handbook	1	1	

** Before the first use, add the appropriate amount of absolute ethanol (ACS grade quality or higher) to Buffer HW1, HW2 as indicated on the bottle.*

*** Proteinase K Solution is stable at 4°C. For long term stability, store it at -20°C. Refer to the instruction of Proteinase K on page 8.*

Materials to Be Supplied by the User

- Reagent : Absolute ethanol (ACS grade quality or higher)
- Disposable material : Sterile pipette tips, Disposable gloves, Sterile microcentrifuge tubes
- Equipment : Microcentrifuge, Vortex mixer, Heat block, Suitable protector

Product Specifications

Exgene™ Forensic SV mini	
Type	Spin
Preparation time	≥30 min
Maximum loading volume of mini column	750 μl
Minimum elution volume	30 μl

Quality Control

All components in the Exgene™ Forensic SV mini are manufactured and maintained in a state of strict cleanliness.
Rigorous quality control is performed consistently across batches, and only the kits meeting the required standards authorized for delivery.

Storage Conditions

All components of Exgene™ Forensic SV mini should be stored at room temperature (15~25°C) and protected from direct sunlight exposure.
During shipment or storage under cool ambient conditions, a precipitate may formed in Buffer HL, BL, or HW1. In such a case, Incubate bottle at 56° prior to use to dissolve precipitates. Using precipitated buffers will lead to poor DNA recovery. Exgene™ Forensic SV mini is guaranteed until the expiration date printed on the product box.

Safety Information

The buffers included in Exgene™ Forensic SV mini contain irritants that can be harmful upon contact with skin or eyes, inhalation or ingestion. Care should be taken when handling such materials. Always wear gloves and eye protection, and follow standard safety precautions.
Buffer HL, BL and HW1 contains chaotropic agents, which can form highly reactive compounds when combined with bleach. Do NOT add bleach or acidic solutions directly to the sample-preparation waste.

Product Disclaimer

Exgene™ Forensic SV mini is intended for molecular biology applications. This product is not intended for the diagnosis, prevention, or treatment of a disease.

Preventing Contamination

Proper microbiological, aseptic technique should always be used when working with trace or evidentiary materials.
Always wear disposable gloves while handling reagents and samples. The use of sterile tip, tube and other instruments is recommended throughout the procedure.

Proteinase K

Exgene™ Forensic SV mini contains Proteinase K to maximize recovery and yield from a variety of sample types.
Add PK-Storage buffer to one tube of lyophilized Proteinase K, and gently invert to dissolve.
Store Proteinase K Solution at 4°C. For storage longer than one year, we suggest storing it at -20°C.

Product Description

The Exgene™ Forensic SV mini is a versatile kit designed for DNA extraction from a variety of sample types, including tissues, forensic samples, or other body fluids. The kit employs advanced silica-binding technology to efficiently extract pure genomic DNA for a wide range of applications. Various samples are first lysed in an optimized buffer containing detergent and lytic enzyme. Under ideal binding conditions, DNA in the lysate binds to a silica membrane, while impurities pass through the membrane into a collection tube. The membranes are washed with a series of alcohol-containing buffer to remove any traces of proteins, cellular debris and salts.

Finally, the purified DNA is eluted into a clean microcentrifuge tube with deionized water or low ionic strength buffer. The purified DNA can be directly used for PCR, qRT-PCR, STR or any downstream application without the need for further manipulation.

A PROTOCOL FOR
Whole blood/Body fluid

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.*

This protocol can be used with
Whole blood/Body fluid

1. **Transfer 200 µl of sample to a 1.5 ml microcentrifuge tube (not provided).** If the sample volume is less than 200 µl, add as much of the sample as possible.

2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly.**

3. **Incubate at 56°C for 10 min and spin down briefly to remove any drops from inside of the lid.**

4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**

5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**

6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**

7. **Add 600 µl of Buffer HW1 to the mini column. Centrifuge at 13,000 rpm for 2 min.**

8. **Add 700 μl of Buffer HW2 to the mini column. Centrifuge at 13,000 rpm for 2 min.**
   Discard the pass-through and then insert the mini column into the new collection tube.

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 50-200 μl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

B PROTOCOL FOR
Mammalian tissue

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL,BL and HW1, heat to dissolve at 56°C before use.*

This protocol can be used with **Mammalian tissue**

1. **Transfer 20 mg of sample to a 1.5 ml microcentrifuge tube (not provided).** The amount of degraded samples should be increased up to 70 mg.

2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly for 15 sec.**

3. **Incubate at 56°C for 30 min. After incubation, briefly vortex and centrifuge at full speed for 5 min.**

4. **Transfer the supernatant to the new 1.5 ml microcentrifuge tube (not provided). Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**

5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**

6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**

7. **Add 600 μl of Buffer HW1 to the mini column. Centrifuge at 13,000 rpm for 2 min.**
   Discard the pass-through and then reinsert the mini column back into the collection tube.

8. **Add 700 μl of Buffer HW2 to the mini column. Centrifuge at 13,000 rpm for 2 min.**
   Discard the pass-through and then insert the mini column into the new collection tube.

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 50-100 μl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

C

PROTOCOL FOR
Rib cartilage/Bone

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.*

This protocol can be used with
Rib cartilage/Bone

1. **Transfer 100 mg of sample to a 1.5 ml microcentrifuge tube (not provided).** Improving the lysis reaction can be achieved by finely grinding the sample.

2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly.**

3. **Incubate at 56°C for 1 h and spin down briefly to remove any drops from inside of the lid.**

4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**

5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**

6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**

7. **Add 600 µl of Buffer HW1 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and reinsert the mini column back into the collection tube.**

8. **Add 700 μl of Buffer HW2 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and insert the mini column into the new collection tube.**

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 50-100 μl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

D PROTOCOL FOR Urine

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.*

This protocol can be used with **Urine**

1. **Transfer 1 ml of sample to a 1.5 ml microcentrifuge tube (not provided) and centrifuge at full speed for 2 min. Then, discard the supernatant.**
   If the sample volume is less than 1 ml, add as much of the sample as possible.

2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly for 15 sec.**

3. **Incubate at 56°C for 30 min and spin down briefly to remove any drops from inside of the lid.**

4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**

5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**

6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**

7. **Add 600 µl of Buffer HW1 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and reinsert the mini column back into the collection tube.**

8. **Add 700 µl of Buffer HW2 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and insert the mini column into the new collection tube.**

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 50-100 µl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

E

PROTOCOL FOR
Hair and Nail clippings

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.*

This protocol can be used with
Hair and Nail clippings

1. **Collect hair or nail clippings sample in a 1.5 ml microcentrifuge tube (not provided).**
2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly.**
3. **Incubate at 56°C for 1 h and spin down briefly to remove any drops from inside of the lid.**
4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**
5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**
6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**

7. **Add 600 µl of Buffer HW1 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and reinsert the mini column back into the collection tube.**

8. **Add 700 µl of Buffer HW2 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and insert the mini column into the new collection tube.**

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 30-50 µl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

F

PROTOCOL FOR
Cigarette butts

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.*

This protocol can be used with
Cigarette butts

1. **Cut out a 2 cm² piece of outer paper from the cigarette or filter, then cut it into 6 smaller pieces. Transfer the pieces to a 1.5 ml microcentrifuge tube (not provided).**

2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly.**

3. **Incubate at 56°C for 1 h and spin down briefly to remove any drops from inside of the lid.**

4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**

5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**

6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**

7. **Add 600 µl of Buffer HW1 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and reinsert the mini column back into the collection tube.**

8. **Add 700 µl of Buffer HW2 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and insert the mini column into the new collection tube.**

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 30-50 µl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

G PROTOCOL FOR
Fingerprint tape

Before experiment

- Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.
- Prepare 1.5 ml microcentrifuge tube.
- Prepare and store absolute ethanol in the freezer.
- All centrifugation should be performed at room temperature.
- Prepare Proteinase K solution (20 mg/ml) for first use.
- If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.

1. **2 cm² piece of sample cut into 6 smaller pieces in a 1.5 ml microcentrifuge tube (not provided).**

2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly.**

3. **Incubate at 56°C for 1 h and spin down briefly to remove any drops from inside of the lid.**

4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**

5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**

6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**

7. **Add 600 µl of Buffer HW1 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and reinsert the mini column back into the collection tube.**

8. **Add 700 µl of Buffer HW2 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and insert the mini column into the new collection tube.**

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 30-50 µl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

H PROTOCOL FOR Insect

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.*

1. **Transfer sample to a 1.5 ml microcentrifuge tube (not provided).**
2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly for 15 sec.**
3. **Incubate at 56°C for 30 min. After incubation, briefly vortex and centrifuge at full speed for 5 min.**
4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**
5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**
6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**
7. **Add 600 µl of Buffer HW1 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and reinsert the mini column back into the collection tube.**

8. **Add 700 μl of Buffer HW2 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and insert the mini column into the new collection tube.**

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 50-100 μl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

I PROTOCOL FOR
Swab

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.*

This protocol can be used with
Swab

1. **Place the swab in a 1.5 ml microcentrifuge tube (not provided).**
2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly.**
3. **Incubate at 56°C for 30 min and spin down briefly to remove any drops from inside of the lid.**
4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**
5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**
6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**
7. **Add 600 µl of Buffer HW1 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and reinsert the mini column back into the collection tube.**

8. **Add 700 µl of Buffer HW2 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and insert the mini column into the new collection tube.**

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 30-100 µl of Buffer AE or nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

J PROTOCOL FOR FTA card

Before experiment

- *Before first use, add absolute ethanol (ACS grade or higher) into Buffer HW1 and HW2 as indicated on the bottle.*
- *Prepare 1.5 ml microcentrifuge tube.*
- *Prepare and store absolute ethanol in the freezer.*
- *All centrifugation should be performed at room temperature.*
- *Prepare Proteinase K solution (20 mg/ml) for first use.*
- *If a precipitate has formed in Buffer HL, BL and HW1, heat to dissolve at 56°C before use.*

This protocol can be used with FTA card

1. **Place 3 pieces of 5 mm² FTA sample in a 1.5 ml microcentrifuge tube (not provided).**
2. **Add 25 µl of Proteinase K solution (20 mg/ml, provided) and 300 µl of Buffer HL to the sample. Vortex vigorously to mix thoroughly.**
3. **Incubate at 56°C for 30 min and spin down briefly to remove any drops from inside of the lid.**
4. **Add 300 µl of Buffer BL to the sample, pulse-vortex to mix the sample thoroughly, and spin down briefly to remove any drops from inside of the lid.**
5. **Add 300 µl of chilled absolute ethanol to the sample, pulse-vortex to mix the sample thoroughly for 15 sec, and spin down briefly to remove any drops from inside of the lid.**
6. **Carefully transfer the mixture to the Column Type G (mini), centrifuge at 13,000 rpm for 2 min, discard the pass-through, and then reinsert the mini column back into the collection tube.**
7. **Add 600 µl of Buffer HW1 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and reinsert the mini column back into the collection tube.**

8. **Add 700 μl of Buffer HW2 to the mini column, centrifuge at 13,000 rpm for 2 min, and discard the pass-through and insert the mini column into the new collection tube.**

9. **Centrifuge at full speed for 3 min to remove residual wash buffer. Place the mini column into a fresh 1.5 ml microcentrifuge tube (not provided).**

10. **Add 30-50 μl of Buffer AE of nuclease-free water to the center of the membrane in the mini column. Incubate at room temperature for 2 min.**

11. **Centrifuge at full speed for 2 min.**

Troubleshooting Guide

Facts	Possible Causes	Suggestions
Low or no yield	**Starting material is too aged or has been improperly stored**	The best yield is typically obtained from fresh samples. DNA yield depends on various factors, including the type, size, age, and storage condition of the starting material. Inappropriate storage, such as blood samples stored at 4°C for more than 5 days, may lead to reduced yields.
	Inefficient or insufficient lysis	For proper lysis, mix sample and lysis buffer thoroughly.
	Decreased proteinase K activity due to improper storage or expiration	Proteinase K must be stored under 4°C after dissolved in PK-Storage buffer for maintenance of proper activity. Proper lysis cannot be performed with degraded proteinase K. It should be replaced with a new one.
	Precipitation of Buffer HL and BL	Storage at cool ambient temperature may cause precipitation in Buffer HL and BL. Incubate bottle at 37°C or above until all precipitates are dissolved.
Low concentration of DNA in eluate	**Low sample input or a small number of cells in the sample**	Either add more starting material or, if needed, minimize the elution volume and re-elute the initial eluate.
	Column clogging	Insufficient lysis may lead to column clogging. Mix the sample with each buffer completely. Reduce the starting amount of sample. Extend the proteinase K incubation time at 56°C or double the amount of proteinase K.

Facts	Possible Causes	Suggestions
Eluate does not perform well in downstream application	**PCR inhibitors present in samples**	PCR inhibitor in gDNA can obstruct PCR reaction. Dilute the elute to use template for PCR reactions.
	Too high concentration of cells in animal tissues	Tissue samples have a lot of cells usually. This total nucleic acid of cells from animal tissue can be competitors with nucleic acid of target gene in PCR reactions. Dilute the elute to 20-250 ng to use template for PCR reactions.
	Buffer HW1 or HW2 was prepared incorrectly	Check that the Buffer HW1 and HW2 concentrates were diluted with the correct volume of absolute ethanol. Repeat the extraction procedure with new samples, if available.
	Residual ethanol from Buffer HW1 or HW2 that remains in the elute	Care must be taken for eliminating the carryover of Buffer HW1 or HW2 before elution step. The membrane of mini spin column should be kept completely dry using additional centrifugation or air-drying.
	High A_{260}/A_{230} ratio	The high DNA concentration may result in a high A_{260}/A_{230} ratio. Reduce sample amount. Reduce the proteinase K incubation time or increase the elution volume.
Low A_{260}/A_{280} ratio	**Insufficient lysis**	Insufficient lysis results in low DNA purity, typically caused by excessive starting material, incomplete mixing with Buffer HL or BL, insufficient lysis time, or inefficient sample disruption. Address these issues in the next preparation.

Ordering Information

GeneAll® *Hybrid-Q™* *for rapid preparation of plasmid DNA*

Products	Scale	Size	Cat. No.	Type
Plasmid Rapidprep	mini	50	100-150	spin
		200	100-102	

GeneAll® *Exprep™* *for preparation of plasmid DNA*

Products	Scale	Size	Cat. No.	Type
Plasmid SV	mini	50	101-150	spin / vacuum
		200	101-102	
	Midi	26	101-226	spin / vacuum
		50	101-250	
		100	101-201	

GeneAll® *Exfection™* *for preparation of transfection-grade plasmid DNA*

Products	Scale	Size	Cat. No.	Type
Plasmid LE *(Low Endotoxin)*	mini	50	111-150	spin / vacuum
		200	111-102	
	Midi	26	111-226	spin / vacuum
		100	111-201	
Plasmid EF *(Endotoxin Free)*	Midi	20	121-220	spin
		100	121-201	

GeneAll® *Expin™* *for purification of fragment DNA*

Products	Scale	Size	Cat. No.	Type
Gel SV	mini	50	102-150	spin / vacuum
		200	102-102	
PCR SV	mini	50	103-150	spin / vacuum
		200	103-102	
CleanUp SV	mini	50	113-150	spin / vacuum
		200	113-102	
Combo GP	mini	50	112-150	spin / vacuum
		200	112-102	

GeneAll® *Exgene™* *for isolation of total DNA*

Products	Scale	Size	Cat. No.	Type
Tissue SV	mini	100	104-101	spin / vacuum
		250	104-152	
	Midi	26	104-226	spin / vacuum
		100	104-201	
	MAXI	10	104-310	spin / vacuum
		26	104-326	
Tissue Plus SV	mini	100	109-101	spin / vacuum
		250	109-152	
	Midi	26	109-226	spin / vacuum
		100	109-201	
	MAXI	10	109-310	spin / vacuum
		26	109-326	

GeneAll® *Exgene™* *for isolation of total DNA*

Products	Scale	Size	Cat. No.	Type
Blood SV	mini	100	105-101	spin / vacuum
		250	105-152	
	Midi	26	105-226	spin / vacuum
		100	105-201	
	MAXI	10	105-310	spin / vacuum
		26	105-326	
Cell SV	mini	100	106-101	spin / vacuum
		250	106-152	
	MAXI	10	106-310	spin / vacuum
		26	106-326	
Clinic SV	mini	100	108-101	spin / vacuum
		250	108-152	
	Midi	26	108-226	spin / vacuum
		100	108-201	
	MAXI	10	108-310	spin / vacuum
		26	108-326	
Genomic DNA micro		50	118-050	spin
Plant SV	mini	100	117-101	spin / vacuum
		250	117-152	
	Midi	26	117-226	spin / vacuum
		100	117-201	
	MAXI	10	117-310	spin / vacuum
		26	117-326	
Soil DNA mini	mini	50	114-150	spin
Stool DNA mini	mini	50	115-150	spin
Stool-Bead DNA mini	mini	50	115-151	spin
Viral DNA/RNA	mini	50	128-150	spin
FFPE Tissue DNA	mini	50	138-150	spin
		250	138-152	

GeneAll® *GenEx™* *for isolation of total DNA without spin column*

Products	Scale	Size	Cat. No.	Type
GenEx™ Blood	Sx	100	220-101	solution
		500	220-105	
	Lx	100	220-301	solution
GenEx™ Cell	Sx	100	221-101	solution
		500	221-105	
	Lx	100	221-301	solution
GenEx™ Tissue	Sx	100	222-101	solution
		500	222-105	
	Lx	100	222-301	solution

Products	Scale	Size	Cat. No.	Type
GeneAll® *GenEx™* *for isolation of total DNA without spin column*				
GenEx™ Plant	Sx	100	227-101	solution
	Mx	100	227-201	
	Lx	100	227-301	
GenEx™ Plant Plus	Sx	100	228-101	solution
	Mx	50	228-250	
	Lx	20	228-320	
GeneAll® *DirEx™* series *for preperation of PCR-template without extraction*				
DirEx™		100	250-101	solution
DirEx™ *Fast*-Tissue		96 T	260-011	solution
DirEx™ *Fast*-Cultured cell		96 T	260-021	solution
DirEx™ *Fast*-Whole blood		96 T	260-031	solution
DirEx™ *Fast*-Blood stain		96 T	260-041	solution
DirEx™ *Fast*-Hair		96 T	260-051	solution
DirEx™ *Fast*-Buccal swab		96 T	260-061	solution
DirEx™ *Fast*-Cigarette		96 T	260-071	solution
GeneAll® RNA series *for preperation of total RNA*				
RiboEx™	mini	100	301-001	solution
		200	301-002	
Hybrid-R™	mini	100	305-101	spin
Hybrid-R™ Blood RNA	mini	50	315-150	spin
Hybrid-R™ miRNA	mini	50	325-150	spin
RiboEx™ LS	mini	100	302-001	solution
		200	302-002	
Riboclear™	mini	50	303-150	spin
Riboclear™ Plus	mini	50	313-150	spin
Ribospin™	mini	50	304-150	spin
Ribospin™ II	mini	50	314-150	spin
		300	314-103	
Ribospin ™ vRD	mini	50	302-150	spin
Ribospin ™ vRD Plus	mini	50	312-150	spin
Ribospin ™ vRD II	mini	50	322-150	spin
Ribospin ™ Plant	mini	50	307-150	spin
Ribospin™ Seed/Fruit	mini	50	317-150	spin
Ribospin™ Pathogen/TNA	mini	50	314-150	spin
		250	314-152	
Allspin™	mini	50	306-150	spin
RiboSaver™	mini	100	351- 001	solution

Products	Size	Cat. No.	Type
GeneAll® *AmpONE™* *for PCR amplification*			
Taq DNA polymerase	250 U	501-025	(2.5 U/μl)
	500 U	501-050	
	1,000 U	501-100	
Taq Premix	20 μl x 96 tubes	526-200	solution
	50 μl x 96 tubes	526-500	
GeneAll® *AmpMaster™* *for PCR amplification*			
Taq Master mix	0.5 ml x 2 tubes	541-010	solution
	0.5 ml x 10 tubes	541-050	solution
GeneAll® *HyperScript™* *for Reverse Transcription*			
Reverse Transcriptase	10,000 U	601-100	solution
RT Master mix	0.5 ml x 2 tubes	601-710	solution
One-step RT-PCR Master mix	0.5 ml x 2 tubes	602-110	solution
One-step RT-PCR Premix	20 μl x 96 tubes	602-102	solution
GeneAll® RealAmp™ *for qPCR amplification*			
SYBR qPCR Master mix (2X, Low ROX)	200 rxn 2 ml	801-020	solution
	500 rxn 5 ml	801-050	
SYBR qPCR Master mix (2X, High ROX)	200 rxn 2 ml	801-021	solution
	500 rxn 5 ml	801-051	
GeneAll® Protein series			
ProtinEx™ Animal cell/tissue	100 ml	701-001	solution
PAGESTA™ Reducing 5X SDS-PAGE Sample Buffer	1 ml x 10 tubes	751-001	solution

Products	Size	Cat. No.	Type
GeneAll® GENTi™ 32 ADVANCED *Newly designed automated extraction system*			
Automatic extraction equipment		GTI032A	system
Genomic DNA	48	901-048A	tube
	96	901-096A	plate
Viral DNA/RNA	48	902-048A	tube
	96	902-096A	plate
Blood DNA	48	903-048A	tube
	96	903-096A	plate
Plant DNA/RNA	48	904-048A	tube
	96	904-096A	plate
LMO	48	906-048A	tube
	96	906-096A	plate
Fecal DNA/RNA	48	913-048A	tube
	96	913-096A	plate
GeneAll® AllEx®64 *Compact yet Comprehensive automated extraction system*			
Automatic extraction equipment		AEX064	system
Genomic DNA	48	931-048A	tube
	96	931-096A	plate
Viral DNA/RNA	48	934-048A	tube
	96	934-096A	plate
Blood DNA	48	935-048A	tube
	96	935-096A	plate
Plant DNA/RNA	48	937-048A	tube
	96	937-096A	plate
Fecal DNA/RNA	48	948-048A	tube
	96	948-096A	plate

NOTE

GeneAll

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