Comparative Evaluation of Genomic DNA Extraction Performance Between Exgene™ Clinic SV mini and Other Commercial DNA Extraction Kits

Experimental Conditions

Materials Required

- Exgene™ Clinic SV mini (Cat. No. 108-101 or 108-152)
- 1.5 ml & 2.0 ml microcentrifuge tube
- 50 ml conical tube
- EDTA tube
- Sterilized swab
- Centrifuge & microcentrifuge (≤15,000 x g)
- Vortex mixer
- Absolute ethanol (≥99.0%, C_2H_5OH, CAS No. 64-17-5)
- 1X PBS (Phosphate Buffered Saline), pH 7.4
- Pipette & sterilized pipette tips
- Suitable protector (e.g., lab coat, disposable gloves, goggles, etc.)

Sample Information

- Extraction conditions

Sample	Sample Amount	Elutoin Volume
Human whole blood	200 µl	50 µl
Saliva (mouthwash)	10 ml	
Buccal swab	1 stick	
Cultured cell (K562)	5 x 10^6 cells	
Urine	1 ml	

Sample Preparation

- **Human whole blood**

1. Prepare human whole blood in EDTA tube or blood collection tube with anticoagulants mixture.
2. Transfer 200 µl of human whole blood to the 1.5 ml microcentrifuge tube and follow the A. protocol for blood and body fluid/ cultured cells using microcentrifuge (Page 18).

- **Saliva (mouthwash)**

1. Collect 10 ml of mouthwash into a 50 ml conical tube and add 5 ml of 1X PBS.
2. Vortex the mixture to mix thoroughly and centrifuge at 2,000 x g for 5 min. Carefully decant the supernatant.
3. Resuspend the pellets completely in 200 µl of 1X PBS and follow the C. protocol for saliva and mouthwash (Page 24).

- **Buccal swab**

1. Collect the oral epithelial cells using sterile swab.
2. Place the swab into a 2.0 ml microcentrifuge tube and cut off the handle of swab with a sterile sharp blade or cutter.
3. Add 400 µl of 1X PBS to the tube and follow the B. protocol for buccal swab (Page 22).

- **Cultured cell (K562)**

1. Transfer the harvested cells into a 1.5 ml microcentrifuge tube and centrifuge at 14,000 x g for 1 min.
2. Discard the supernatant and resuspend the cell pellet with 200 µl of 1X PBS. Follow the A. protocol for blood and body fluid/ cultured cells using microcentrifuge (Page 18).

- **Urine**

1. Transfer 1 ml of urine to a 1.5 ml microcentrifuge tube and centrifuge at 6,000 x g above for 2 min.
2. Discard the supernatant and add 200 µl of 1X PBS then vortex the tube for 5 sec.
3. Centrifuge at 6,000 x g above for 2 min. Then discard the supernatant.
4. Follow the A. protocol for blood and body fluid/cultured cells using microcentrifuge (Page 18).

*** For more details and methods, please refer to the handbook of Exgene™ Blood/ Clinic/Cell SV mini protocol.**

Result

Sample	Kit	Yield (µg)	$A_{260/280}$
Human whole blood	Exgene™ Clinic SV mini	**5.15**	1.86
	Supplier A	**2.62**	1.90
	Supplier B	**2.93**	1.83
Saliva (mouthwash)	Exgene™ Clinic SV mini	**0.78**	2.00
	Supplier A	**0.61**	2.16
	Supplier B	**0.91**	2.02
Buccal swab	Exgene™ Clinic SV mini	**0.21**	2.39
	Supplier A	**0.16**	2.56
	Supplier B	**0.17**	3.39
Cultured cell (K562)	Exgene™ Clinic SV mini	**2.17**	1.89
	Supplier A	**1.60**	1.90
	Supplier B	**3.11**	2.00
Urine	Exgene™ Clinic SV mini	**0.05**	1.21
	Supplier A	**0.09**	2.17
	Supplier B	**0.12**	2.14

Table 1. Absorbance analysis of genomic DNA extracted from different types of samples with Exgene™ Clinic SV mini and other commercial DNA extraction kits
Genomic DNA was extracted three times from each of five different samples using Exgene™ Clinic SV mini and genomic DNA extraction kits from Supplier A and Supplier B.
The concentration and purity of the eluate were determined using a spectrophotometer (NanoDrop™ 2000, Supplier T), and the yield was calculated based on the measured values. Each value represents the average of triplicate measurements.

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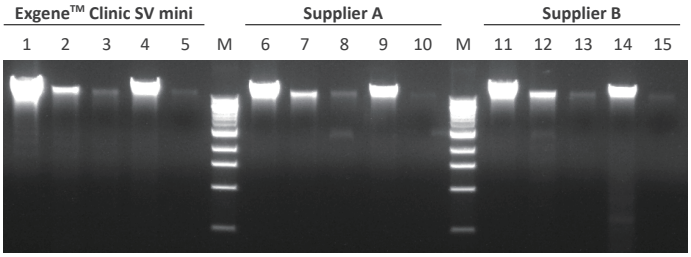
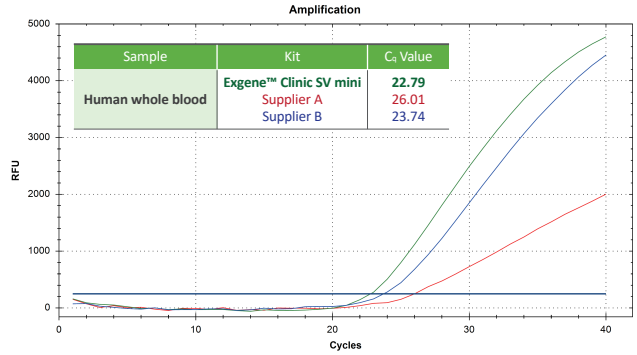
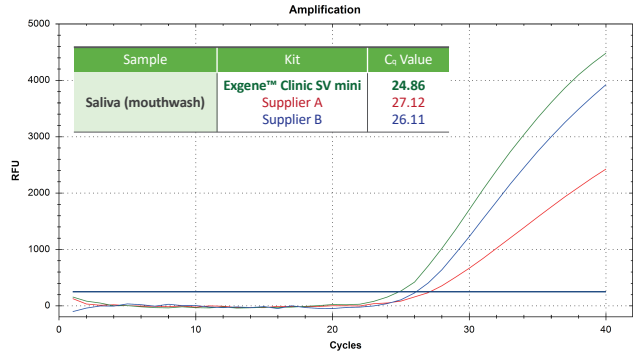
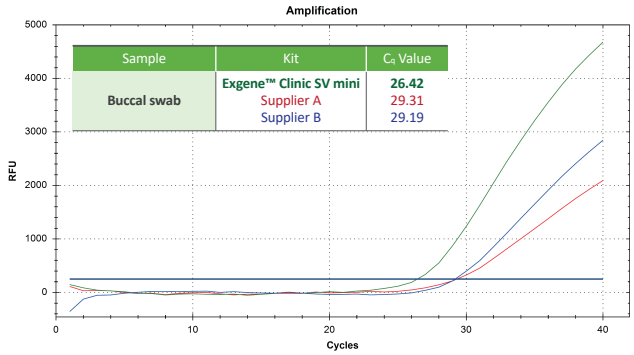


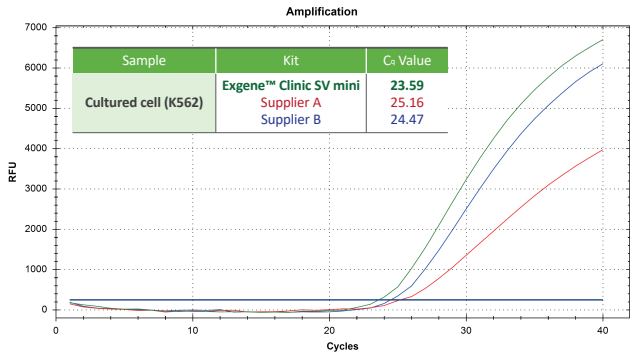
Figure 1. Electrophoresis analysis of genomic DNA extracted using Exgene™ Clinic SV mini and other commercial DNA extraction kits from various sample types
Genomic DNA was extracted from each sample using Exgene™ Clinic SV mini and two other commercial DNA extraction kits. Extracted DNA in triplicate was analyzed by electrophoresis in a 1.2% agarose gel and visualized under UV light.

- **Lane Information**
  M : GENESTA™ 1 kb DNA Ladder (GA-100)
  Lane 1, 6, 11 : DNA eluate from human whole blood
  Lane 2, 7, 12 : DNA eluate from saliva (mouthwash)
  Lane 3, 8, 13 : DNA eluate from buccal swab
  Lane 4, 9, 14 : DNA eluate from cultured cell (K562)
  Lane 5, 10, 15 : DNA eluate from urine









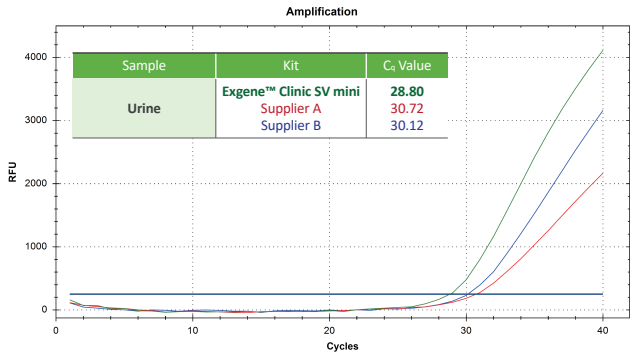


Figure 2. C_q value on a real-time PCR (qPCR) amplification curve obtained from DNA extracted from each sample
Each amplification curve shows real-time PCR (qPCR) amplification of DNA template extracted from each sample using Exgene™ Clinic SV mini and two other commercial DNA extraction kits. The each C_q value in the table are represented by different colors.

- **PCR Information**
  PCR primer : Human GAPDH
  Real-time PCR (qPCR) instrument : CFX96™ (1855201, Supplier B)
  Real-time PCR (qPCR) kit : RealAmp™ 2X qPCR Master Mix (801-050)