Comparing Yield and Quality of Genomic DNA extracted from Four Different Cell Types

Experimental Conditions

Materials Required

- Exgene™ Cell SV mini (100 preps: 106-101 / 250 preps: 106-152)
- Commercial DNA extraction kit (supplier A)
- 200 U of lyticase or 20 U of zymolase (for yeast cell lysis)
- 30 mg/ml of lysozyme or 300 µl/ml of lysostaphin (for gram-positive cell lysis)
- Ice (maintaining the normal state of the enzyme solution and Proteinase K solution)
- Microcentrifuge tube (for sample preparation)
- Microcentrifuge (≤15,000 x g)
- Vortex mixer
- Heating block
- Absolute ethanol (≥95.0%, C_2H_5OH, CAS No.: 64-17-5)
- Pipette & sterile pipette tips
- Suitable protector (e.g., lab coat, disposable gloves, goggles, etc.)

Sample Information

- Sample type
  - K562 (5 x 10^6 cells), cultured cells
  - DH5α (2 x 10^9 cells), gram negative bacteria
  - *Lactobacillus* (2 x 10^9 cells), gram positive bacteria
  - Total yeast (5 x 10^7 cells)

- Extraction conditions
  - Sample amount: according to each protocol
  - Elution volume: 50 µl

Protocol

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

K562: The protocol is according to **A. Protocol for Blood and Body Fluid/Cultured Cells using Microcentrifuge (page 18–20).**

DH5α: The protocol is according to **K. Protocol for Gram Negative Bacteria (page 37)** and then the next step is according to **G. Protocol for Animal Tissue (step 3 on page 31).**

Lactobacillus: The protocol is according to **L. Protocol for Gram Positive Bacteria (page 38–39)** and then the next step is according to **G. Protocol for Animal Tissue (step 5 on page 31).**

Total yeast: The protocol is according to **M. Protocol for Yeast (page 40–41)** and then the next step is according to **G. Protocol for Animal Tissue (step 3 on page 31).**

Result

Kit	K562 (A)			
	Yield (µg)	$A_{260/280}$	$A_{260/230}$	CV (%)
Exgene™ Cell SV	18.49	1.99	2.09	1.84
Supplier A	17.02	1.98	2.11	1.71

Kit	DH5α (B)			
	Yield (µg)	$A_{260/280}$	$A_{260/230}$	CV (%)
Exgene™ Cell SV	17.19	1.99	2.08	3.19
Supplier A	15.93	1.98	2.06	1.98

Kit	*Lactobacillus* (C)			
	Yield (µg)	$A_{260/280}$	$A_{260/230}$	CV (%)
Exgene™ Cell SV	15.04	1.99	2.11	0.68
Supplier A	13.57	1.98	2.14	2.58

Kit	Yeast (D)			
	Yield (µg)	$A_{260/280}$	$A_{260/230}$	CV (%)
Exgene™ Cell SV	11.14	2.01	2.07	2.09
Supplier A	9.95	2.00	2.07	1.03

Table 1. Comparison of average yield, purity and CV (coefficient of variation) values of DNA extracted from 4 samples using each DNA extraction kit
The DNA were extracted from four samples using Exgene™ Cell SV mini and commercial DNA extraction kit (supplier A). All eluates were analyzed with a absorbance using NanoDrop™ 2000. The absorbance was performed in triplicated and then the results were averaged. The yield and CV values were calculated based on the measured absorbance values.

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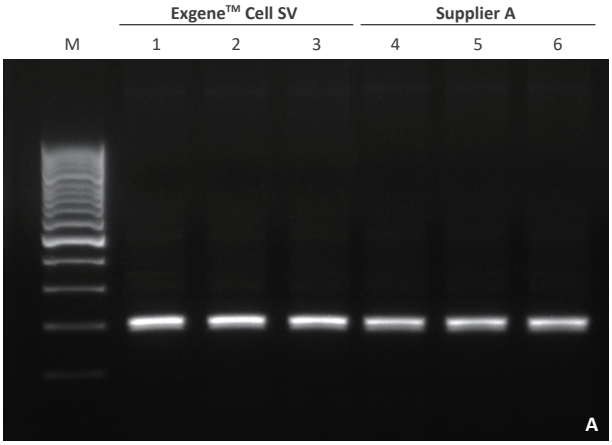
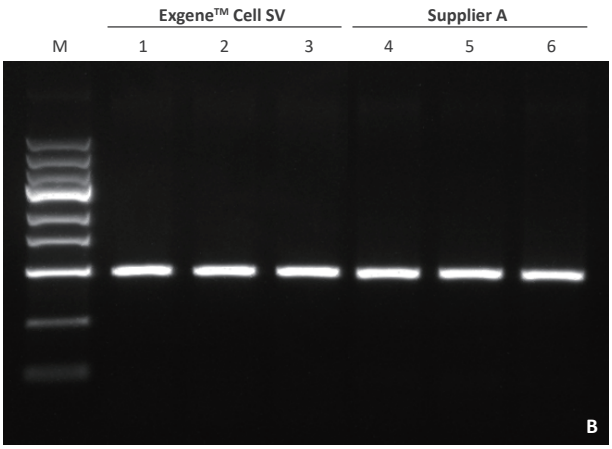
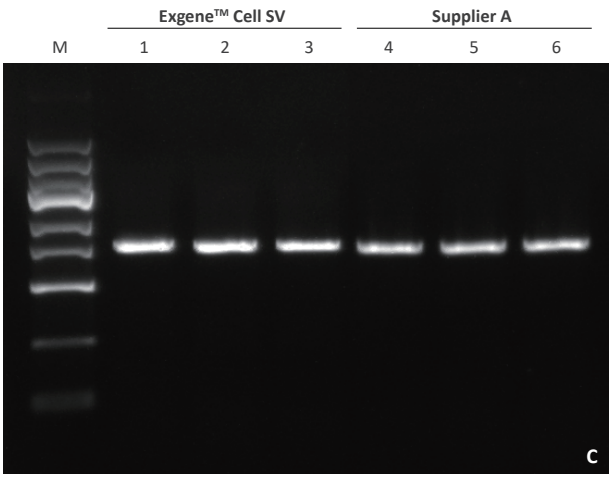


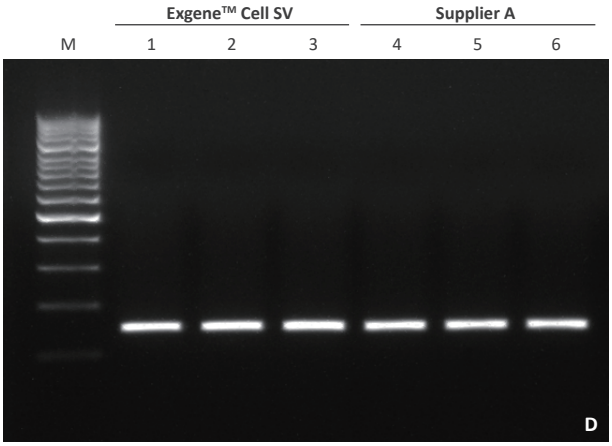
2.0% agarose gel, 5 µl loading, 150 V, 30 min
DNA ladder size: 100 bp
PCR product size: 205 bp



1.2% agarose gel, 5 µl loading, 150 V, 30 min
DNA ladder size: 250 bp
PCR product size: 500 bp



1.2% agarose gel, 5 µl loading, 150 V, 30 min
DNA ladder size: 250 bp
PCR product size: 500 bp



2.0% agarose gel, 5 µl loading, 150 V, 30 min
DNA ladder size: 100 bp
PCR product size: 205 bp

Figure 1. Comparison of gel electrophoresis of DNA extracted from four samples using each DNA extraction kit
After DNA templates were extracted from four samples with Exgene™ Cell SV mini and commercial DNA extraction kit (supplier A), all DNA templates were performed in triplicate with conventional PCR methods. Eluted PCR products were analyzed with gel electrophoresis using ethidium bromide staining.

- **Figure and PCR primer information**
  Figure A: K562 cells, human GAPDH primer
  Figure B: DH5α, bacteria universal primer
  Figure C: *Lactobacillus*, uvrC primer
  Figure D: total yeast, Scer primer

- **Lane information**
  Lane M: GENESTA™ 100 bp / 250 bp DNA ladder (GA-010 / GA-025)
  Lane 1–3: Exgene™ Cell SV mini
  Lane 4–6: DNA Extraction kit from supplier A

- **PCR system and kit information**
  MultiGene™ Optimax Thermal Cycler (TC9610, supplier L)
  AmpMaster™ 2X *Taq* Master Mix (541-010 / 541-050)