

Exgene™ Tissue SV (*plus!*)

Exgene™ Blood SV

Exgene™ Clinic SV

Exgene™ Cell SV

Exgene™ Plant SV

Exgene™ Soil DNA mini

Exgene™ Genomic DNA micro

Exgene™ Stool DNA mini

Exgene™ Viral DNA / RNA

GeneX™ Blood / Cell / Tissue / Plant (*plus!*)

DirEx™ / DirEx™ Fast

## 2014 GeneAll® Total DNA Purification System



# Total DNA Purification System

Exgene™ and GenEx™ series are designed for the purification of total DNA from a variety of sample sources. Exgene™ series provide fast and easy methods in convenient spin or vacuum column format and there are no need phenol extraction or alcohol precipitation. GenEx™ series provide convenient, scalable purification methods in the specially formulated buffer system. DirEx™ can be conveniently used for preparation of total DNA from various biological samples without the use of toxic chemical such as phenol or chloroform.

Purified total DNA can be directly applicable in conventional PCR, real-time PCR, southern blotting, genotyping, RFLP and other downstream applications.

Sample Type	B C T										
	Exgene™ Tissue SV (plus)*	Exgene™ Blood SV	Exgene™ Cell SV	Exgene™ Clinic SV	Exgene™ Genomic DNA micro	Exgene™ Viral DNA / RNA	Exgene™ Plant SV	Exgene™ Soil DNA mini	GenEx™ ** Blood / Cell / Tissue	GenEx™ Plant (plus)***	DirEx™ / DirEx™ Fast
Animal tissue	○		○	○	○						○
Body fluid		○	○	○	○	○					○
Bone					○						△
Buccal swab	△	○	○	○	○					○	○
Buffy coat		○	○	○	△				△		
Callus							○				○
Cultured cells	○	○	○	○	△	○				○	○
DNA Virus		○	○	○	△	○				△	
Dried blood spot	△		○	○	○					△	○
Fixed tissue	△		○	○	△					△	
Forensic sample					○						△
Fungi							○	△			○
Gram(-) bacteria	○		○	○	△					○	○
Gram(+) bacteria			○							△	△
Hair	△	○	○	○	○					△	○
Lichens							○				
Insect / worm	○		△	△	△					○	△
Mammalian whole blood	○*	○	○	○	○				○		○
Nail					○						○
Nucleated blood	△	○	○	○	△					△	△
Paraffin block	○		○	○	△					○	
Plant cells							○				○
Plant tissue							○				○
Rodent tails	○		○	○	△					○	○
Saliva		○	○	○	○	○				△	
Soil								○			
Sperm		○	○	○	○					△	
Urine	△		△	△	○	○				△	
Yeast			○							△	△

○ Recommended / △ Suitable but not optimized and required additional protocol

\* Exgene™ Tissue plus! kit provides the additional methods for the purification of total DNA from mammalian whole blood.

\*\* GenEx™ series provide convenient, scalable purification methods in the specially formulated buffer systems.

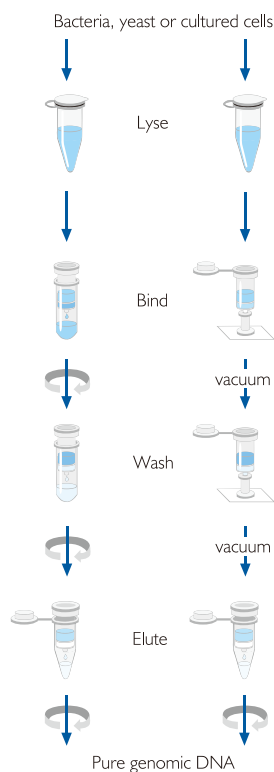
\*\*\* GenEx™ Plant plus! kit has an additional feature, EzSep™ filter column for cleared supernatant

# Exgene™ Cell SV

For the isolation of DNA from cultured cell, yeast, gram positive / negative bacteria and etc.

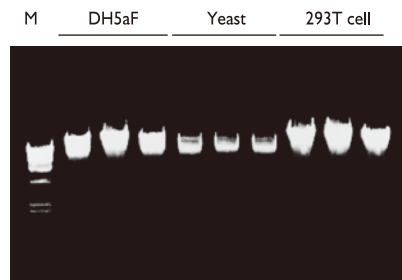
in microcentrifuges

on vacuum manifolds



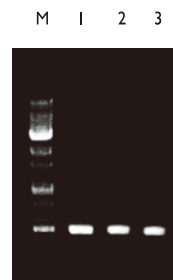
- Spin or vacuum column format
- Accurate and consistent DNA extraction from gram positive or negative bacteria, cultured cell, yeast and various biological samples
- High purity : 1.8 ~ 2.0
- Simple and safe procedure
- No use of organic solvents
- Ready for use in PCR, Southern blotting, AFLP, RFLP, RAPD and other enzymatic reactions

## Result from various samples



Genomic DNA prepared from a several species of cells using Exgene™ Cell SV kit. 5  $\mu$ l out of 100  $\mu$ l eluate was resolved on 0.8 % agarose gel.  
M : Lambda-HindIII

## PCR Amplification



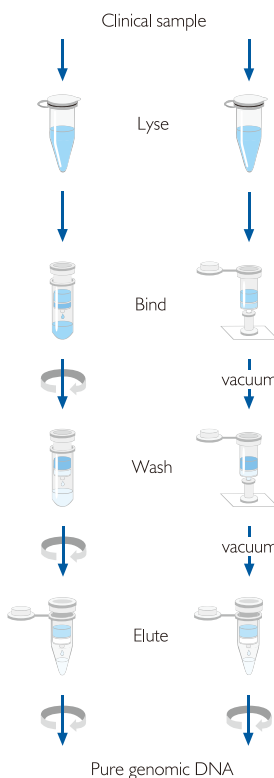
PCR reaction was performed with purified DNA using Exgene™ Cell SV kit. Template DNA was isolated from E. coli DH5aF (Lane 1, 2, 3).  
PCR reaction was performed with genomic DNA purified from DH5aF using Cell SV kit.  
M : Lambda-HindIII

# Exgene™ Clinic SV

For the isolation of DNA from clinical tissues including whole blood

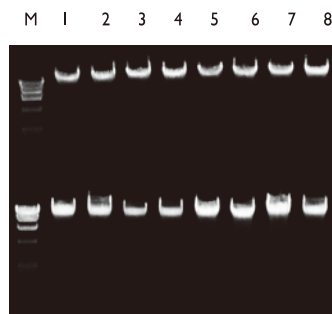
in microcentrifuges

on vacuum manifolds



- Spin or vacuum column format
- Easy and fast purification of high-quality DNA
- Accurate and consistent DNA extraction from various clinical samples including tissue, whole blood and body fluids
- Instant use : No need of additional materials
- No organic extraction or alcohol precipitation
- Consistent and high yields
- High purity : 1.8 ~ 2.0
- Ready for use in PCR, Southern blotting, Genotyping and etc.

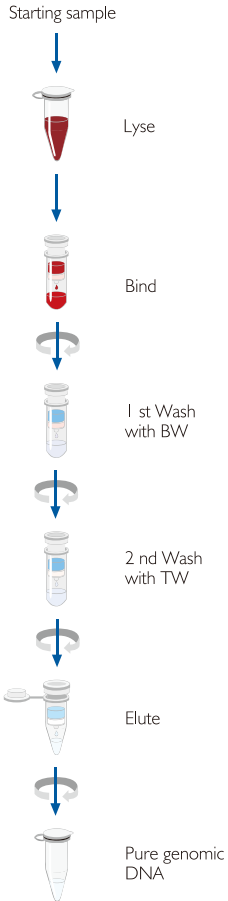
## Consistent Result from Various Samples



Total DNA purified from various sample tissue using Exgene™ Clinic SV mini is resolved on 0.8 % agarose gel.  
M : Lambda-HindIII

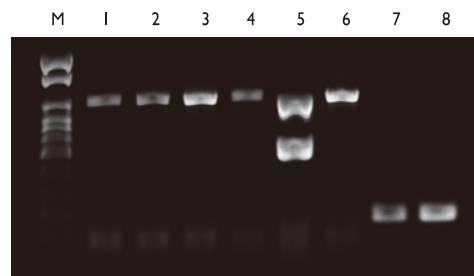
# Exgene™ Genomic DNA micro

For the isolation of DNA from micro-scale biological samples



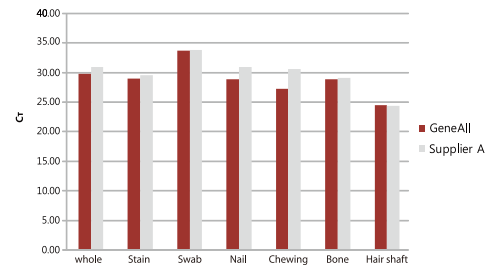
- Spin column format
- Apply to trace of sample : use of micro column
- Various protocol for forensic sample : stain, chewing gum, cigarette butts, tooth brush and etc.
- Simple and safe procedure
- Stable and consistent result
- Instant use : No need of additional materials
- No use of organic solvents
- High yield and purity
- Ready for use in general PCR, qPCR, Genotyping such as STR analysis and other downstream applications

## PCR Amplification



PCR reaction was performed with purified DNA using Exgene™ Genomic DNA micro kit. Template was isolated from whole blood (Lane 1), dried blood spot (Lane 2), hair root (Lane 3), chewing gum (Lane 4), animal tissue (Lane 5), urine (Lane 6), bone (Lane 7) and hair shaft (Lane 8). M : 1 kb ladder

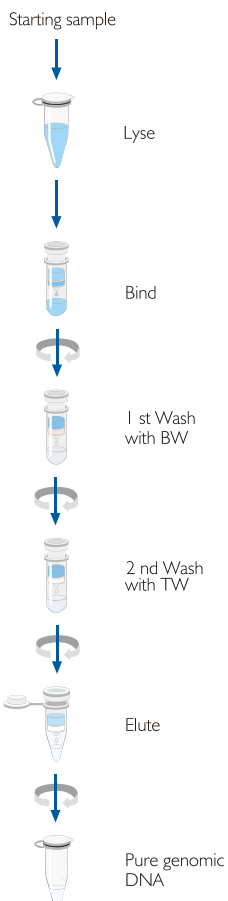
## Real-Time PCR Amplification



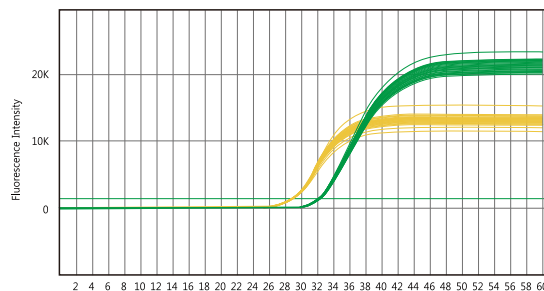
DNA extraction from various biological samples using Exgene™ Genomic DNA micro kit or a kit from Supplier A. Real-time PCR was carried out human GAPDH primer sets or mitochondria hypervariable region I primer sets and detected by SYBR® Green reagent.

# Exgene™ Viral DNA / RNA

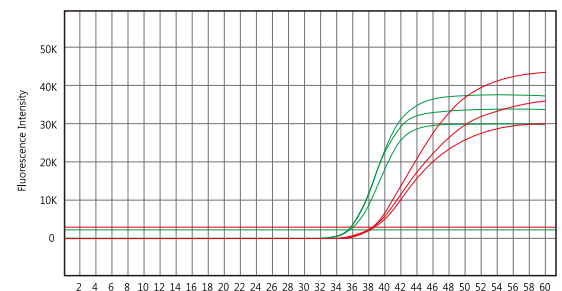
For the isolation of DNA from plant cells and tissues



- Spin column format
- Stable and consistent result
- Fast and simple procedure
- Instant use : No need of additional materials
- No use of organic solvents
- Ready for use in real-time PCR and general PCR
- Optimized for liquid sample : Blood serum, plasma, liquid culture cell, and etc.
- High detection efficiency : use of carrier RNA and micro column

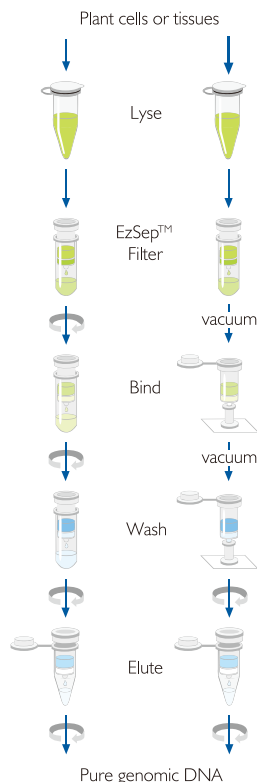


Exgene™ Viral DNA/RNA kit consistency test:  
HIV positive was diluted to 1000 IU/ml with human serum. Extraction tests of HIV samples of 24 repeats were performed with Exgene™ Viral DNA/RNA kit and the consistent result was confirmed by real-time PCR.  
Green is HIV signal and yellow is IC (internal control) signal.



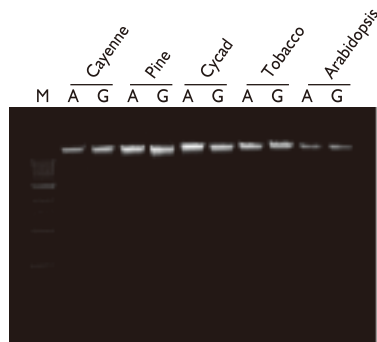
Results from different clinical human serum:  
The extracted HIV (50 IU/ml, orange) and HBV (50 IU/ml, green) nucleic acids using Exgene™ Viral DNA/RNA kit were amplified and detected by real-time PCR.  
Three repeat tests were performed for each sample.

in microcentrifuges    on vacuum manifolds



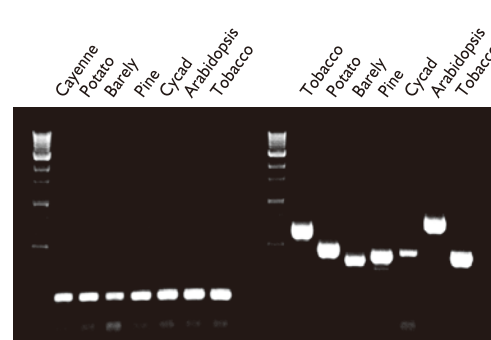
- Spin or vacuum column format
- Stable and consistent DNA extraction from plant cells, tissues and fungi
- Instant use : No need of additional materials
- Perfect removal of second metabolites such as polyphenols and polysaccharides
- Simple procedure by the use of EzSep™ filter column
- No use of organic solvents
- Ready for use in PCR, Southern blotting, AFLP, RFLP, RAPD and other enzymatic reactions

## Comparison of DNA Extraction

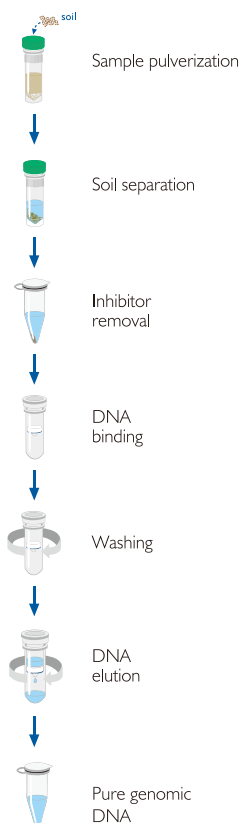


Genomic DNA was extracted from each 100 mg of various samples and analyzed on 0.8 % agarose gel. To compare with supplier A, same kind and amount of each plant samples were subjected to extraction. A : supplier A    G : Exgene™ Plant SV kit  
M : 1 kb ladder

## PCR Amplification

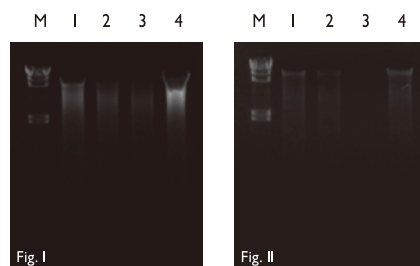


PCR reaction was performed with purified DNA using Exgene™ Plant SV kit. Two primer sets were used : trnL region (left lanes) and large subunit rDNA region on plasmid



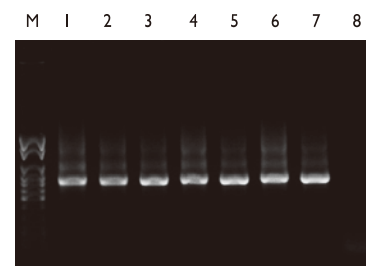
- Spin column format
- Sample size : Up to 500 mg
- Easy and fast purification of high-quality DNA
- Preparation time : 25 minutes
- Efficient lysis step using Powerbead™ tube
- Perfect removal of humic acid
- Stable and consistent yield
- No organic extraction or alcohol precipitation
- High purity : ready for the conventional and real-time PCR

## Comparison of DNA Extraction



DNA isolated from various soil samples with Exgene™ Soil DNA mini (Fig. I) vs supplier A (Fig. II) (used vortex homogenization method)  
Lane M : Lambda-HindIII  
Lane 1 : Soil under cherry blossom    Lane 2 : Soil of onion patch  
Lane 3 : Soil of cabbage patch    Lane 4 : Mud

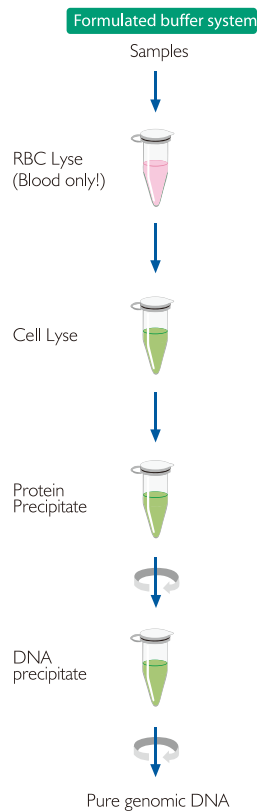
## PCR Result



DNA was purified from various soil samples using Exgene™ Soil DNA mini. And then, the 16s rRNA was amplified by PCR and confirmed by electrophoresis.  
Lane M : 100 bp ladder  
Lane 1 : Pot soil  
Lane 2 : Soil under cherry blossom A    Lane 5 : Soil of cabbage patch B  
Lane 3 : Soil of cabbage patch A    Lane 6 : Soil under cherry blossom C  
Lane 4 : Soil under cherry blossom B    Lane 7 : Soil of cabbage patch C  
Lane 8 : Negative control

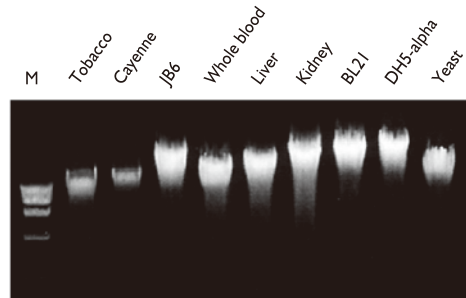
# GenEx™ Blood / Cell / Tissue

For the isolation of DNA from whole blood, cultured cell, animal tissue and etc.



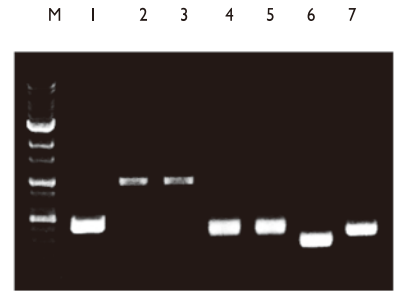
- Specially formulated buffer system
- DNA preparation from diverse sample; whole blood, cultured cell, yeast, bacteria, animal tissue and etc.
- Recovery of very high molecular weight DNA
- Rescalable preparation depending on sample amount
- No organic extraction
- High purity : ready for PCR, Southern blotting and other downstream applications

## Result from Various Samples



Genomic DNA prepared from several kinds of organism using GenEx™ Genomic DNA Isolation kit. 5  $\mu$ l of eluate from each sample was resolved on 0.7% agarose gel.

## PCR Amplification



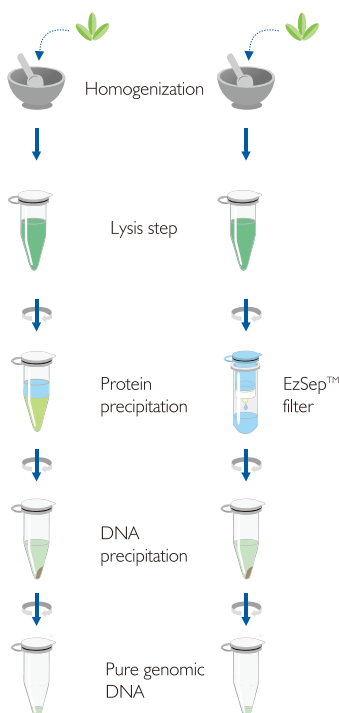
PCR reaction was performed with purified DNA using GenEx™ Genomic Isolation kit. Template DNA was isolated from Tobacco (Lane 1), BL21 (Lane 2), DH5 $\alpha$  (Lane 3), Liver (Lane 4), Kidney (Lane 5), Whole blood (Lane 6) and JB6 (Lane 7). M : 1 kb ladder

# GenEx™ Plant ( plus! )

For the isolation of DNA from various plant samples

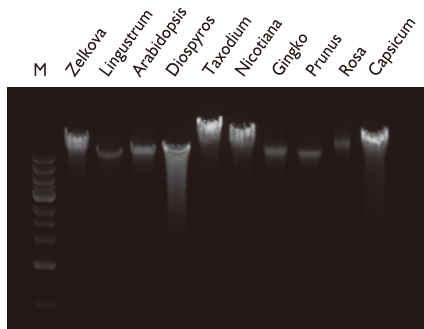
GenEx™ Plant

GenEx™ Plant plus!



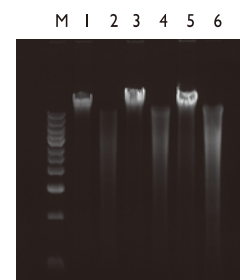
- Specially formulated buffer system
- DNA preparation from various plant samples
- Recovery of very high molecular weight DNA
- Rescalable preparation depending on sample amount
- No organic extraction
- High purity : ready for PCR, Southern blotting and other downstream applications
- Simple separation of supernatant by EzSep™ filter (plus! only)

## Genomic DNA Purification Result



Total DNA prepared from various plant leaves using GenEx™ Plant kit. Each sample is extracted from 100 mg of tissue approximately. And 4  $\mu$ l of purified DNA were resolved on 1.0 % agarose gel. M : 1 kb DNA ladder

## Restriction Enzyme Assay

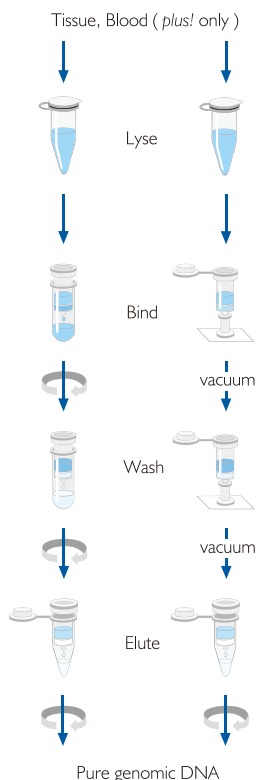


Total DNA (Lane 1, 3, 5) purified from the leaves of several species using GenEx™ Plant was subjected to restricted digestion (Lane 2, 4, 6) by HindIII. Lane M : 1 kb DNA ladder  
Lane 1 : Zelkova  
Lane 3 : Taxodium  
Lane 5 : Nicotiana

# Exgene™ Tissue SV ( plus! )

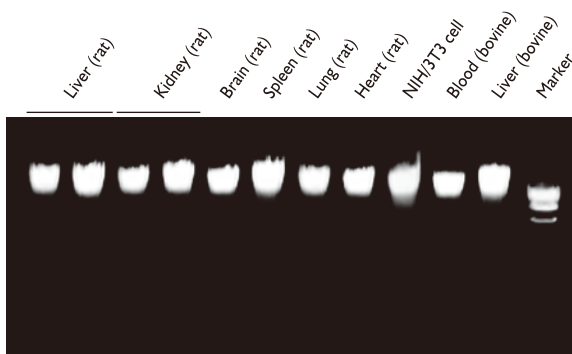
For the isolation of DNA from tissues, cells and whole blood ( plus! only )

in microcentrifuges    on vacuum manifolds



- Spin or vacuum column format
- Accurate and consistent DNA extraction from animal tissues, cultured cell line and whole blood ( plus! only )
- Instant use : No need of additional materials
- Simple and safe procedure
- High purity : 1.8 ~ 2.0
- No use of organic solvents
- Ready for use in PCR, Southern blotting, AFLP, RFLP, RAPD and other enzymatic reactions

## DNA Extraction from Various Samples

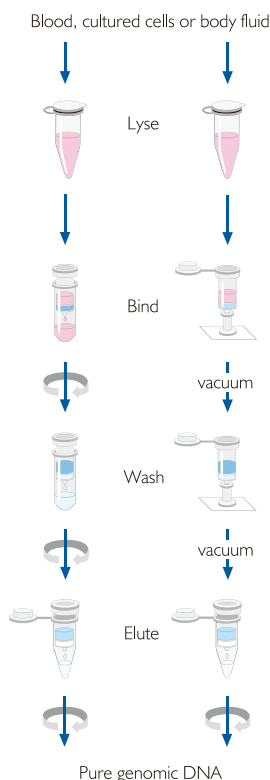


DNA purification using Exgene™ Tissue SV kit. DNA from several kinds of animal tissue was prepared. Elution was performed with 100  $\mu$ l of Buffer AE. 8  $\mu$ l of eluates was resolved on 0.8 % agarose gel.

# Exgene™ Blood SV

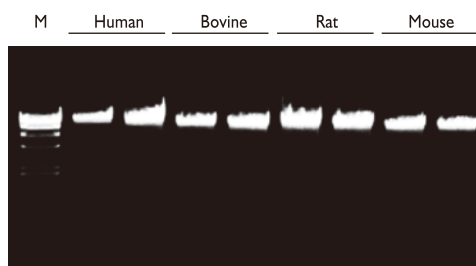
For the purification of DNA from blood and its derivatives

in microcentrifuges    on vacuum manifolds



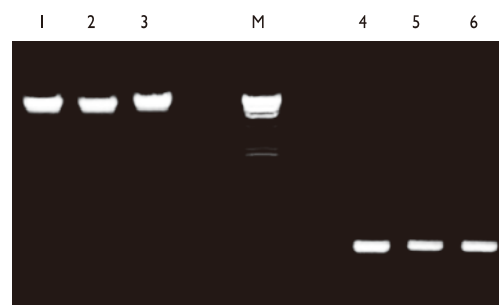
- Spin or vacuum column format
- Accurate and consistent DNA extraction from whole blood, buffy coat, serum, plasma, cultured cells
- Instant use : No need of additional materials
- Fast, safe and simple procedure completed in 20 minutes (mini), 1 hour (Midi, MAXI)
- High purity : 1.8 ~ 2.0
- No use of organic solvents
- Ready for use in PCR, Southern blotting and other enzymatic reactions

## DNA Extraction from Various Sample



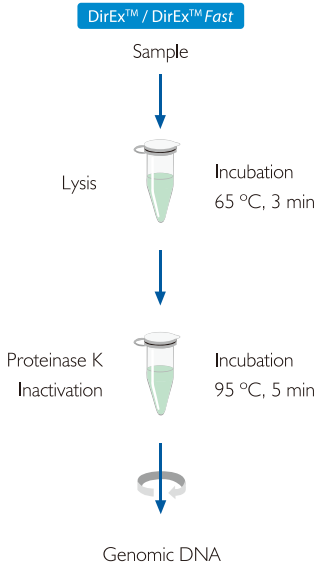
Genomic DNA purified from various rat blood samples using Exgene™ Blood SV mini kit was partially digested with EcoRI (Lane 2 ~ 3, 5 ~ 6, 8 ~ 9). Lane 1, 4, 7 represent undigested DNA. M : 1 kb ladder

## PCR Amplification

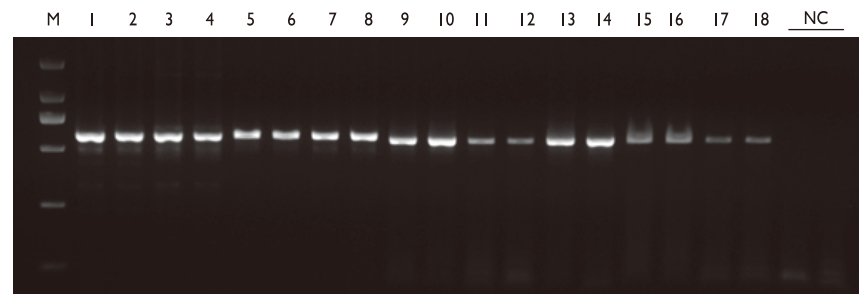


PCR reaction was performed with purified DNA using Exgene™ Blood SV kit as template. Each lane 1, 2 and 3 corresponds to the template of each PCR product (Lane 4, 5, 6). Template DNA was isolated from whole blood of rat (SD) and the exon region of GAPDH gene was amplified with Taq polymerase.

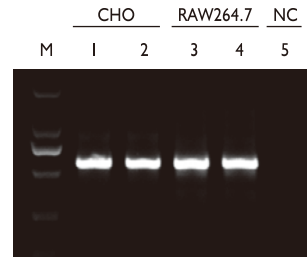
- Specially formulated buffer system as single tube PCR-template preparation solution
- Ready for PCR in just 8 minutes
- Easy and simple procedure : only two steps
- Stable and consistent result
- Instant use : No need of additional reagents
- Pre-mixed format for minimal handling : DirEx™ Fast
- Optimized protocols for various samples such as cell, tissue, hair, buccal swab, blood, cigarette butts



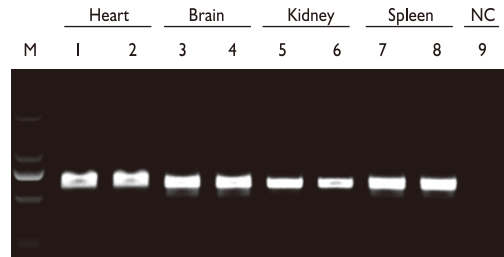
## PCR Results



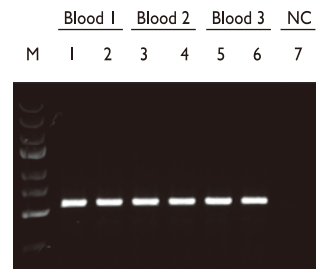
PCR analysis was performed with extracted DNA using GeneAll® DirEx™. Template DNA was isolated from CHO cells (Lane 1,2), RAW264.7 cells (Lane 3,4), Heart (Lane 5,6), Brain (Lane 7,8), Whole blood (Lane 9,10), Dried blood spot (Lane 11,12), Hair follicle (Lane 13,14), Buccal swab (Lane 15,16), Cigarette butts (Lane 17,18).  
 NC : Negative control Primer : Beta-actin (Lane 1~8, Rat), Globin (Lane 9~18, Human) M : 250 bp ladder



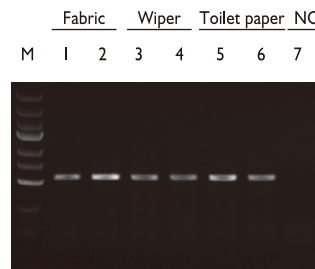
Total DNA was isolated from two types of mammalian cells using DirEx™ Fast-Cultured cell.  
 NC : Negative control Primer : Beta-actin (Rat)



PCR analysis was carried out with DNA isolated by DirEx™ Fast-Tissue. Template DNA was extracted from mammalian tissues (RAT) such as heart, brain, kidney, and spleen.  
 NC : Negative control Primer : Beta-actin (Rat)



Total DNA was extracted from three types of human blood using DirEx™ Fast-Whole blood. The template DNA was amplified by PCR.  
 NC : Negative control Primer : Globin (Human)



PCR analysis was confirmed with DNA isolated by DirEx™ Fast-Blood stain. The template DNA was isolated from three types of dried blood stained on fabric, wiper, and toilet paper.  
 NC : Negative control Primer : Globin (Human)



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