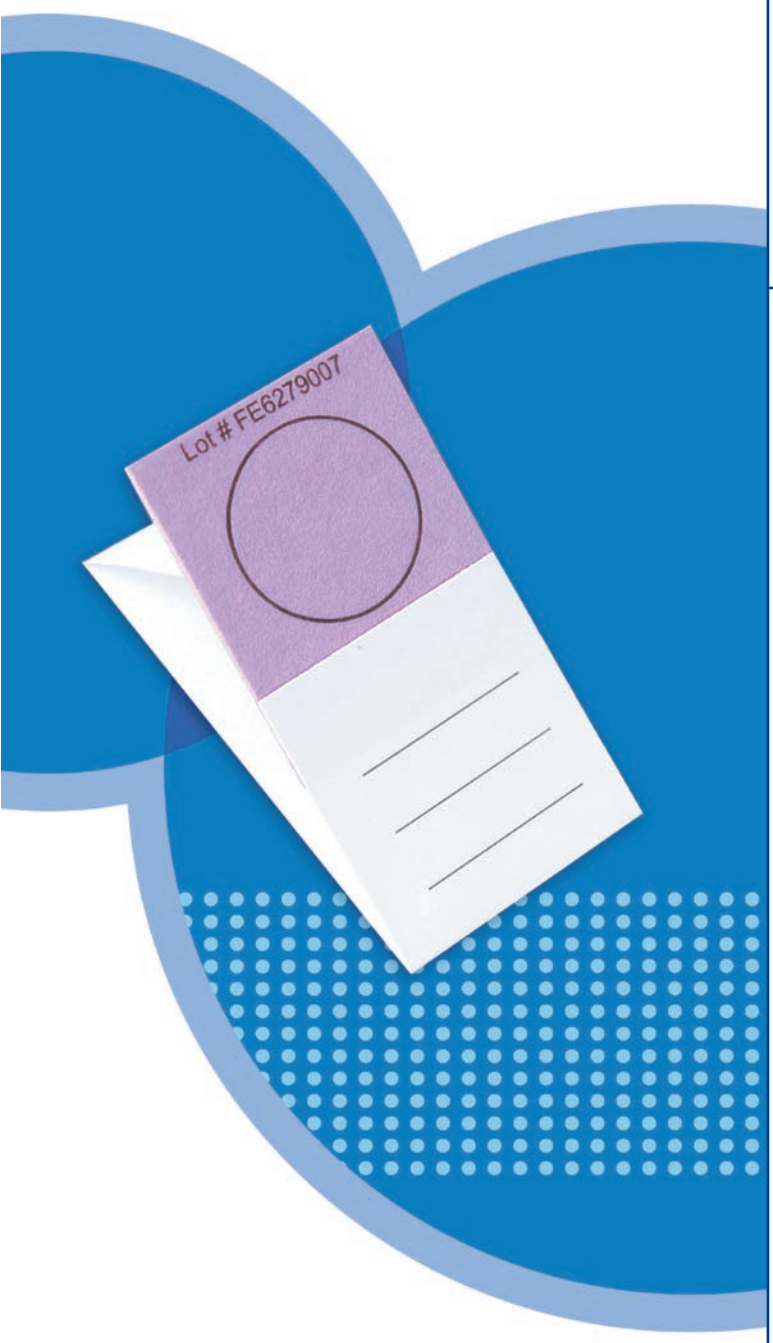
Whatman®
Part of GE Healthcare

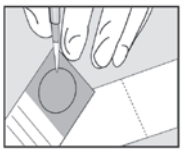
Indicating FTA® Elute Cards

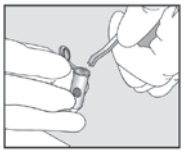


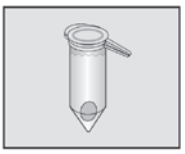
Long-term DNA storage combined with easy water elution: Indicating FTA Elute Cards provide a cost effective room temperature method for collecting, shipping, archiving and processing nucleic acids from a wide variety of biological samples. Indicating FTA Elute Cards contain an inert dye that changes from purple to white indicating the location of a clear, colorless sample. FTA Elute Cards inactivate pathogens for user safety and facilitate rapid purification of nucleic acids in less than 30 minutes per sample. Indicating FTA Elute provides DNA in solution for multiple amplification reactions.

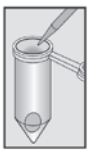
INDICATING FTA ELUTE PROCEDURE

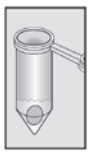
- **Apply** sample to Indicating FTA Elute Cards and let dry completely for 3 hours at room temperature or for 15 minutes at 80° C
- **Remove** one 3.0 mm disc from the white sample area on the Indicating FTA Elute Card and place into a 1.5 mL microfuge tube
- **Wash** with 500 µL of sterile H_2O by pulse vortexing 3 times for a total of 5 seconds
- **Transfer** the disc to a new 0.5 mL microfuge tube containing 30 µL sterile H_2O ensuring that the disc is completely submerged
- **Transfer** tube to a heat block at 95° C for 15–30 minutes
- **Remove** the sample from the block and pulse vortex, or gently tap the sample approximately 60 times
- **Centrifuge** for 30 seconds, to separate the matrix from the eluate. The eluate now contains the purified DNA
- **Remove** the FTA Elute matrix disc using a sterile pipette tip and discard
- **Store** the eluted DNA at -20° C until required

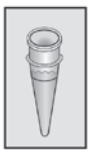












Features	Benefits
Samples can be collected, shipped and stored at room temperature	• Eliminates high costs associated with shipping samples on ice • Eliminates high costs associated with laboratory freezer storage requirements
Sample processing requires a simple water elution procedure to isolate DNA	• Eliminates the high cost of using a purification kit
Indicating dye for sample location	• Confidence that every punch will contain amplifiable DNA
Sample processing time to isolate DNA is 5–30 minutes	• Eliminates lengthy multiple step procedures
Sample volume requirements are minimal	• DNA extraction from small amounts of precious samples
PCR inhibitors and proteins are bound to the Indicating FTA Elute matrix	• Yields soluble DNA free of PCR inhibitors

APPLICATIONS

- Biobanking
- Pharmacogenomics
- Genotyping
- Rapid DNA Isolation
- Molecular Diagnostics
- Genetic Identification
- Microbial Identification
- PCR/qPCR
- Whole Genome Amplification

SAMPLE TYPES

- Buccal Cells
- Saliva
- Urine
- Cultured Cells
- Bacteria Cultures

COMPARABLE PCR AMPLIFICATION FROM FTA ELUTE AND INDICATING FTA ELUTE

Figure 1 shows the results for PCR amplification for samples on FTA Elute and Indicating FTA Elute. Blood and buccal cells were applied to both matrices and DNA recovered using elution with water and heat. Eluted DNA was amplified for a 268bp fragment of the human β-globin gene. PCR amplicons were analyzed using the Experion Bioanalyzer (Bio-Rad) according to the manufacturer's instructions.

The data show that comparable results are obtained using both FTA Elute and Indicating FTA Elute for the sample types tested.

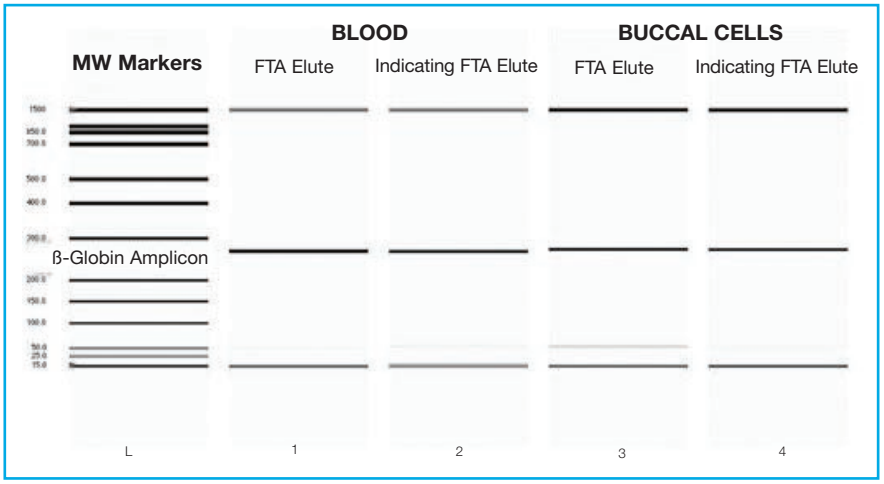


Figure 1: Blood and Buccal Cell Samples on FTA Elute and Indicating FTA Elute

DNA RECOVERED FROM FTA ELUTE IS A TEMPLATE FOR LONG PCR AMPLICONS

In order to determine whether DNA eluted from FTA Elute can serve as a template for longer PCR fragments an amplification ladder was prepared. Fragments of increasing length were amplified and separated using the Experion BioAnalyzer (Bio-Rad). Figure 2 shows the amplification pattern of human buccal cell DNA recovered from Indicating FTA Elute. PCR primers for fragments as high as 5kb were tested for amplification demonstrating that DNA eluted from Indicating FTA Elute is able to support long PCR.

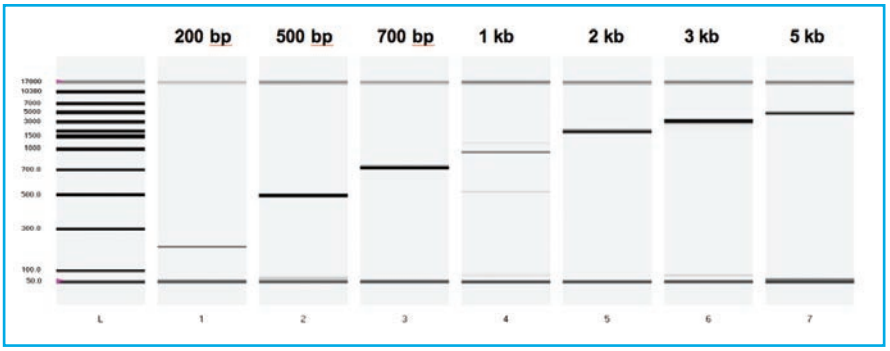


Figure 2: Amplification Ladder of DNA Recovered from FTA Elute

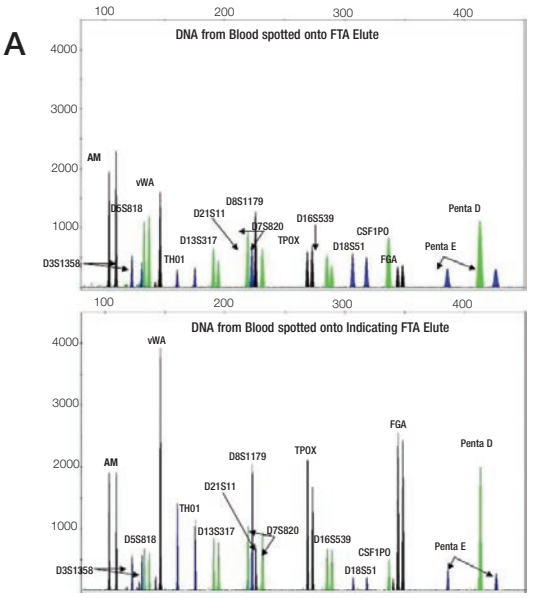


Figure 3: STR Profiles from Blood and Buccal Cell DNA Recovered from Indicating FTA Elute and FTA Elute

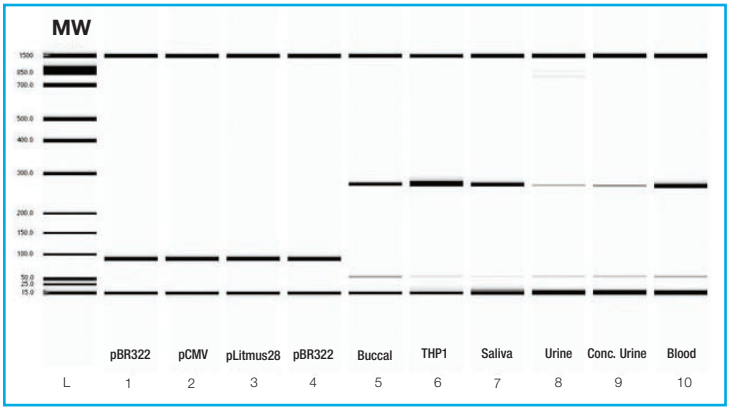


Figure 4: Analysis of Different Sample Types on Indicating FTA Elute

Buccal Sample 1A	2 mm punch (n=11)	
	ng/µL	Total ngs
1	0.40	11.85
2	0.37	11.24
3	0.55	16.45
4	0.57	17.08
5	0.38	11.37
6	0.54	16.12
7	0.15	4.59
8	0.02	0.59
9	0.44	13.33
10	0.17	5.12
Avg. Yield	0.36	10.77

Buccal Sample 1B	3 mm punch (n=3)	
	ng/µL	Total ngs
1	0.41	24.64
2	0.62	37.10
3	0.35	20.97
4	0.90	54.07
5	0.47	27.95
6	0.32	19.39
7	0.55	33.03
8	0.58	34.55
9	0.70	42.23
10	0.41	24.40
11	0.61	36.39
12	0.91	54.44
Avg. Yield	0.57	34.10

Table 1: DNA Yield from Indicating FTA Elute

STR ANALYSIS

A main application of the DNA purified from a human sample using FTA Elute is for human identification through the use of Short Tandem Repeats or STRs. STRs are short DNA fragments amplified from genomic DNA which discriminate individuals apart on a genetic basis. Blood (Figure 3A) and buccal cells (Figure 3B) were taken from a single individual and applied to both FTA Elute and Indicating FTA Elute to compare the STR pattern from DNA on both matrices.

The amplification reaction consists of a multiplex PCR of 13–16 fragments. In Figure 3, 1 ng of input DNA from FTA Elute and Indicating FTA Elute was amplified using a Promega PowerPlex® 16 system and fragments analyzed using an ABI Prism® 310 Genetic Analyzer.

PCR AMPLIFICATION OF DNA FROM VARIOUS SAMPLE TYPES

A variety of sample types which are clear or colorless were applied to Indicating FTA Elute (Figure 4). The color change from purple to white indicates the location of the sample.

Lanes 1–4 represent a 91 bp β-lactamase gene fragment amplified from plasmid DNA in bacteria Top 10 or DH5α cells. Lanes 5–10 represent human cell samples which were amplified for the 268 bp β-globin gene. Dilute samples such as urine gave a strong amplified signal.

DNA YIELD FROM INDICATING FTA ELUTE

The yield of DNA from buccal cells was examined from both 2 mm (Table 1A) and 3 mm punches from Indicating FTA Elute (Table 1B). DNA from single 2 mm punches was eluted in 30 µL and DNA from pairs of 3 mm punches was eluted in 60 µL water. The DNA yield was determined by real time PCR using ABI Absolute Quantitation system RNaseP on an ABI Prism 7900HT. Each data point in the 3 mm punch column represents an average of 3 punch sets from a single buccal cell donor, while the 2 mm disc values represent the average of 11 points within a single buccal cell transfer area.

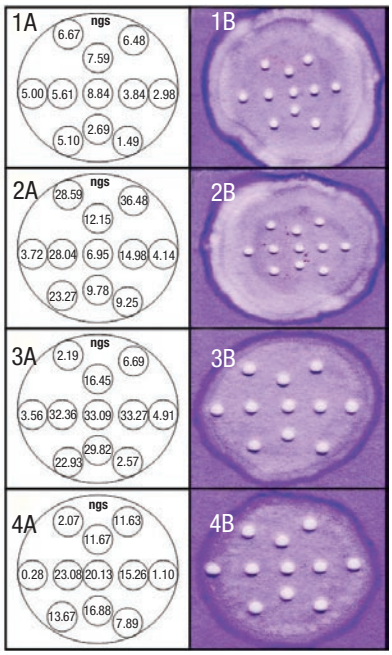


Figure 5: DNA Distribution across Buccal Samples

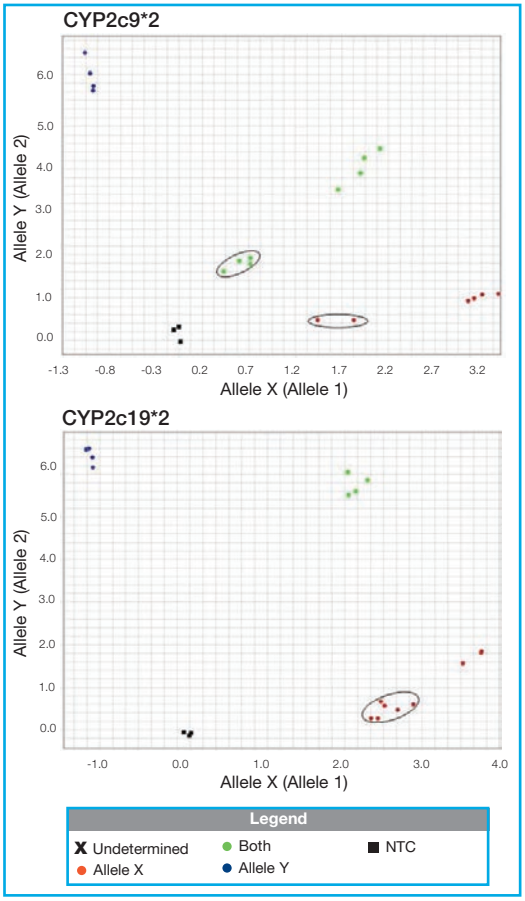


Figure 6: Allelic Discrimination SNP Analysis

DNA YIELD DISTRIBUTION

The distribution of cells collected on Indicating FTA Elute was measured as a function of yield using real time PCR. Buccal cell samples were collected with Whatman EasiCollect™ and deposited onto Indicating FTA Elute Cards. In Figure 5, eleven 2 mm punches were removed from each buccal sample to create an area map. Each 2 mm punch was processed according to the standard FTA Elute protocol with DNA elution into 30 µL of water. Panels A show the total DNA recovered from each punch corresponding to the location in panels B. There are similar DNA recoveries between punches but clearly some punches sample cell clumps containing higher concentrations of cells.

ALLELIC DISCRIMINATION

The plot in Figure 6 shows a typical example of mutation detection from high quality DNA eluted from Indicating FTA Elute from 6 related individuals. DNA was measured using the ABI Absolute Quantitation system RNaseP and analyzed using TaqMan Allelic Discrimination assays (Applied Biosystems). The DNA from Indicating FTA Elute Cards provided a quality template sufficient for multiple Allelic Discrimination assays. The data show that four members of the family are heterozygous for the CYP2c9*2 allele 1 and 2 while the other 2 members are homozygous for the allele 1. All 6 members of the family are homozygous for the CYP2c19*2 SNP allele 1.

CONCLUSIONS

Indicating FTA Elute contains an inert dye that changes color upon application of a clear color-less sample. Indicating FTA Elute is used for samples such as buccal cells, urine, saliva and cultured cells. DNA recovered from Indicating FTA Elute is of the same quality as from FTA Elute.

Whatman Catalog Number	Description	Quantity/Pack
WB120412	Indicating FTA Elute Micro Card	25
WB120411	Indicating FTA Elute Micro Card	100
WB120401	FTA Elute Micro Card	25
WB120410	FTA Elute Micro Card	100

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Whatman Quality

Whatman is a global leader in separations technology and is known in the scientific community for providing Innovative products and solutions. Our instinct for simplification accelerates the rate of discovery, reduces costs and saves time. For more information, visit www.whatman.com

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