

Whatman®

 **EasiCollect™**
Consistent, reliable DNA collection—every time.

EasiCollect is a novel development in the process of collecting buccal cell samples for genetic analysis. The EasiCollect system allows the uniform collection and application of cells to the surface of an FTA® Card for the capture of DNA.

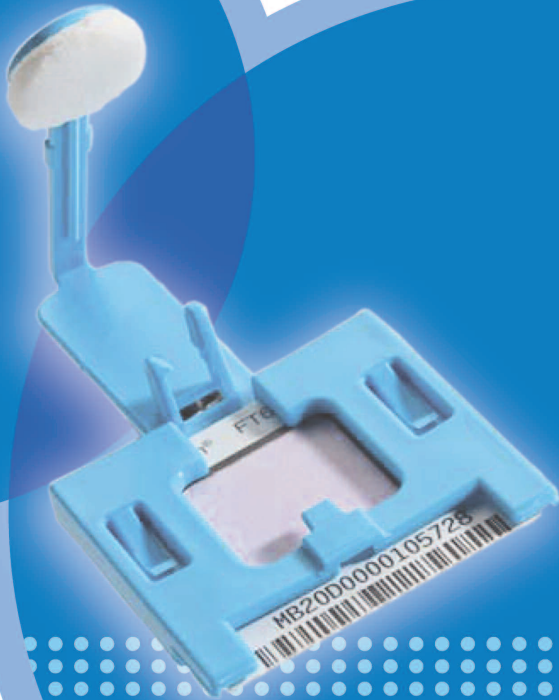
FTA® Cards provide a cost effective room temperature method for collecting, shipping, archiving, and processing nucleic acids from a wide variety of biological samples. FTA Cards inactivate pathogens for user safety and facilitate rapid purification of nucleic acids. Purification of nucleic acids on FTA Cards takes less than 30 minutes per sample when performed manually. With automation, time and labor are reduced and throughput is increased.

The method produces high quality DNA for PCR and other downstream applications such as STR and SNP genotyping.

Buccal cell collection, in the past, has been a notoriously difficult process. This has mainly been due to the differences in the ability of various individuals to shed cells. The reliability of most methods of buccal cell collection has always been a problem. There have also been issues with the ability of the cells to be deposited on a matrix in a uniform manner for reproducible sampling. Sampling an area of a matrix has occasionally missed deposits of cells. This has led to resampling, reprocessing and reamplification of samples costing time and money. There has clearly been a need for a more reliable way to collect and process buccal cell samples for genetic analysis.

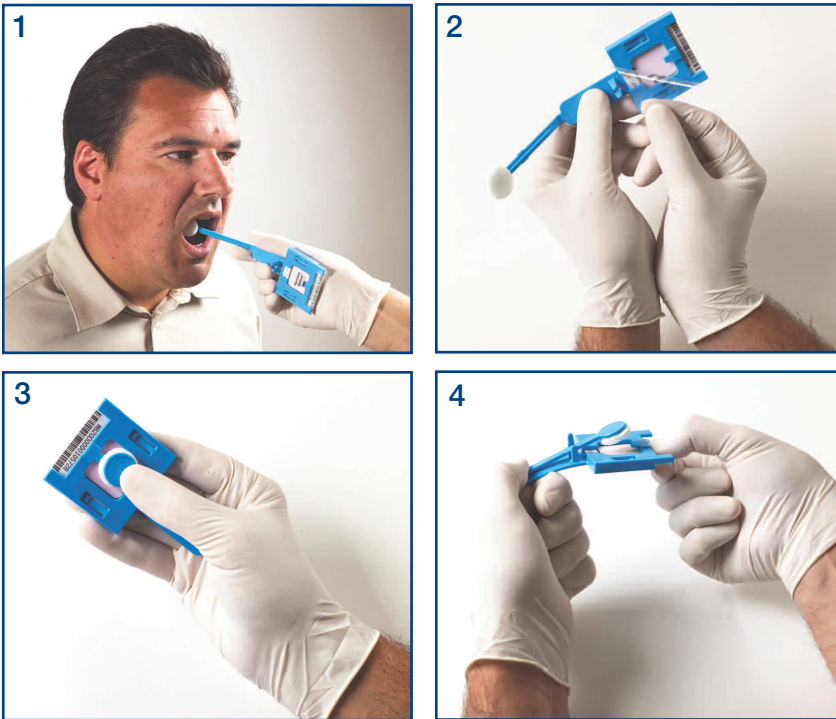
EasiCollect eliminates the difficulties of buccal cell collection. The unique design has been engineered for maximal cell collection and uniform application to FTA, the leading DNA collection and storage matrix. The unique foam collection surface has been specifically selected for its ability to capture the largest number of cells to overcome the individual differences. The pressure clips molded into the EasiCollect device ensures a uniform and constant pressure for the reproducible transfer of cells to FTA. The FTA Card chosen for the device is compatible with manual or automated punching systems which encompass all degrees of laboratory throughput.

FTA is the market leader in DNA capture for genetic analysis. With over 17 years of DNA stability, EasiCollect and FTA are the system of choice for buccal cell collection and DNA stabilization.



Advantages	Benefits
Novel foam composition	Large numbers of cells captured for analysis
Consistent cell transfer	No need to resample
Uniform cell distribution	Confidence of amplifiable DNA in each punch
FTA Inside	Superior room temperature storage and rapid DNA preparation
Automation friendly FTA Card	Fits high-throughput punching devices for maximum throughput

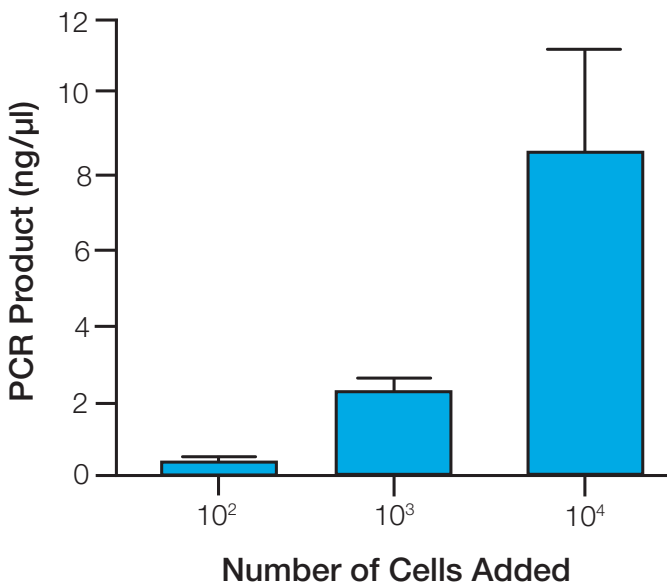
Figure 1.  **EasiCollect™ METHOD**



EASY STEPS TO BUCCAL CELL COLLECTION

1. Collect cells by rubbing each cheek for 15 seconds
2. Peel off the protective film exposing the FTA Card
3. Snap the foam head in place for 10 seconds to transfer the cells to the FTA Card
4. Bend device to lift the foam from the FTA Card. Remove Card, dry and process

Figure 2. THP-1 CELLS APPLIED WITH  **EasiCollect™**



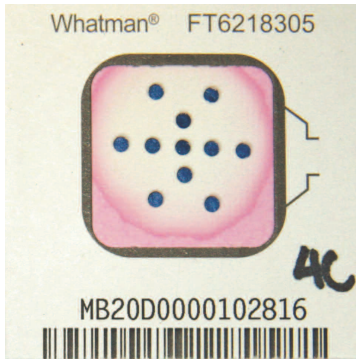
FOAM CAPTURE AND CELLULAR TRANSFER OF THP-1 CELLS

In order to test the ability of EasiCollect to transfer cells to the FTA Cards, varying numbers of cultured THP-1 cells were applied to the foam applicator of the EasiCollect device and transferred to the FTA Card. Quantitation of a β -globin PCR fragment end point analysis was used to determine the yield of DNA present on an FTA disk; the yield of PCR amplicon is approximately proportional to the concentration of DNA on the disk. Cells were applied to the EasiCollect foam applicator as 100 μ L containing 10², 10³ and 10⁴ cells and subsequently transferred to the FTA matrix by closing the device and allowing the foam head to be held in place for 10 seconds.

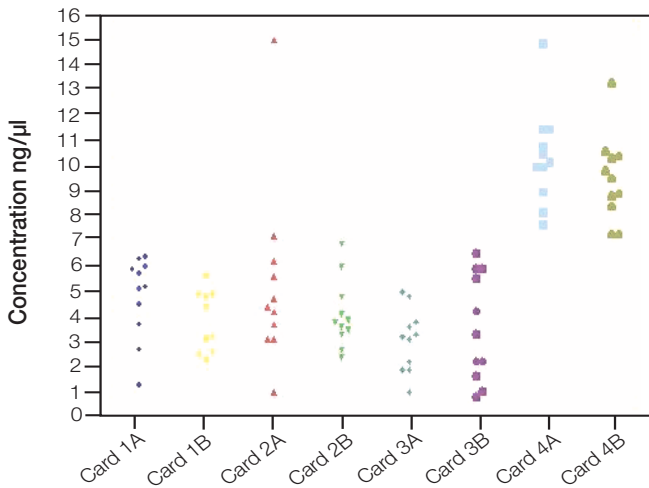
Figure 2 shows a yield of the PCR product obtained from each dilution of cultured cells transferred from the EasiCollect device to the FTA Card. As few as 100 cells could be detected after application to the FTA Card demonstrating excellent transfer and detection of cells in sufficient quantities to support amplification of DNA. 2 mm disks were punched from the FTA for PCR.

Figure 3. DISTRIBUTION OF CELLS APPLIED TO FTA USING EasiCollect™

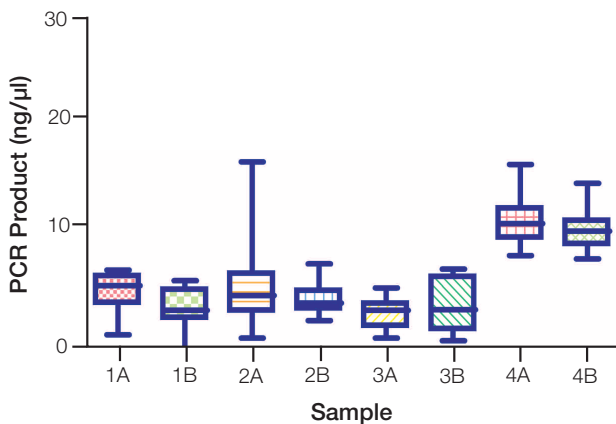
A



B



C



BUCCAL CELL DISTRIBUTION USING EasiCollect™

In order to examine the distribution and uniformity of cells applied using the EasiCollect device, a map of the sample area was prepared. Disks (2 mm) were taken from the sample area in a specific pattern (Figure 3A) to cover the sample area including the periphery. Each disk was amplified for a 268 bp portion of the β -globin gene and quantified using an Experion Automated Electrophoresis System (Bio-Rad) by running 1K chips following the manufacturer's instructions (Figure 3B).

Analysis of 88 disks demonstrated amplifiable DNA in all but one disk. This represents a 99% success rate from all regions of the sample area. The Box and Whiskers Plot in Figure 3C shows a very tight distribution of DNA in duplicate samples from 4 individuals.

STR ANALYSIS

Buccal cell samples were taken for STR analysis. Two 1.2 mm punches were collected from central locations of each FTA card from 4 separate individuals. All disks were processed following standard protocols. STR analysis was performed using the Promega PowerPlex 16® system following manufacturer's instructions. PCR was carried out using an Applied Biosystems 7900HT thermocycler and PCR products were separated on an Applied Biosystem's PRISM® 310 Genetic Analyzer. Analysis of products was carried out using GeneMapper 3.2® software.

Analysis of STR profiles demonstrate excellent peak shape, height and baseline to baseline determination. All alleles were called accurately compared to the kit standards (Figure 4).

Figure 4. STR ANALYSIS OF 4 INDIVIDUALS

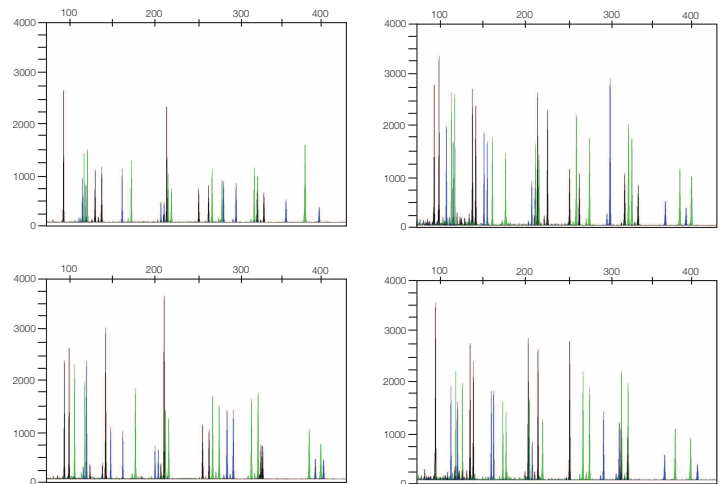
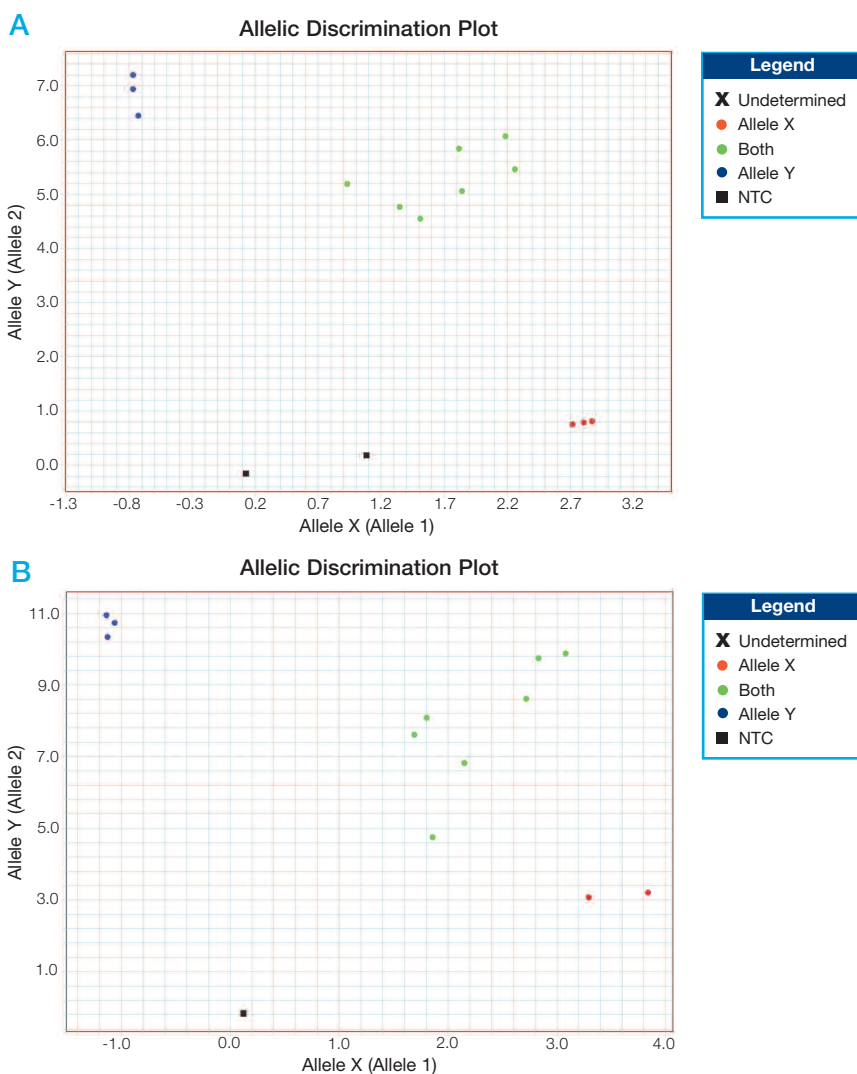


Figure 5. ALLELIC DISCRIMINATION SNP GENOTYPING



The plot in Figure 5 shows a typical example of mutation detection from high quality DNA captured by FTA using the EasiCollect system. FTA sample disks (3.0mm) were prepared from buccal cell DNA collected with EasiCollect. The disks were used as template for end-point PCR using TaqMan® probes for CYP2C9*2 (A) and CYP2C19*2 (B) to discriminate between two alleles of single nucleotide polymorphisms (SNPs). In this example the individual was heterozygous for the alleles.

CONCLUSIONS

EasiCollect is the quickest, most reliable way to collect buccal cells for DNA analysis

EasiCollect is a simple to use device to reproducibly collect buccal cells for consistent transfer to FTA cards. EasiCollect represents a major step forward in the reproducible collection of cells for genetic analysis for forensics, human identification, SNP genotyping, pharmacogenomics and for future developments. Coupled with the ability to preserve DNA on FTA Cards, the EasiCollect system is a valuable tool for the collection and storage of DNA.

Whatman Catalog Number	Description	Quantity/Pack
WB120462	EasiCollect	50

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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