



cfDNA Extraction from Plasma for Liquid Biopsy

Apostle MiniMax™ High Efficiency cfDNA Isolation Kit

The Apostle MiniMax™ High Efficiency cfDNA Isolation Kit is a cell-free DNA (cfDNA) isolation reagent kit built on magnetic bead-based technology. It has been demonstrated to purify cfDNA from human plasma in both manual and automated workflows.

- Data representative of results of cfDNA extracted from 1-5 mL of plasma
- Demonstrated compatibility with a variety of collection tubes
- cfDNA purity shown to be suitable for downstream PCR-based assays

Good performance with plasma collected in a variety of collection tubes

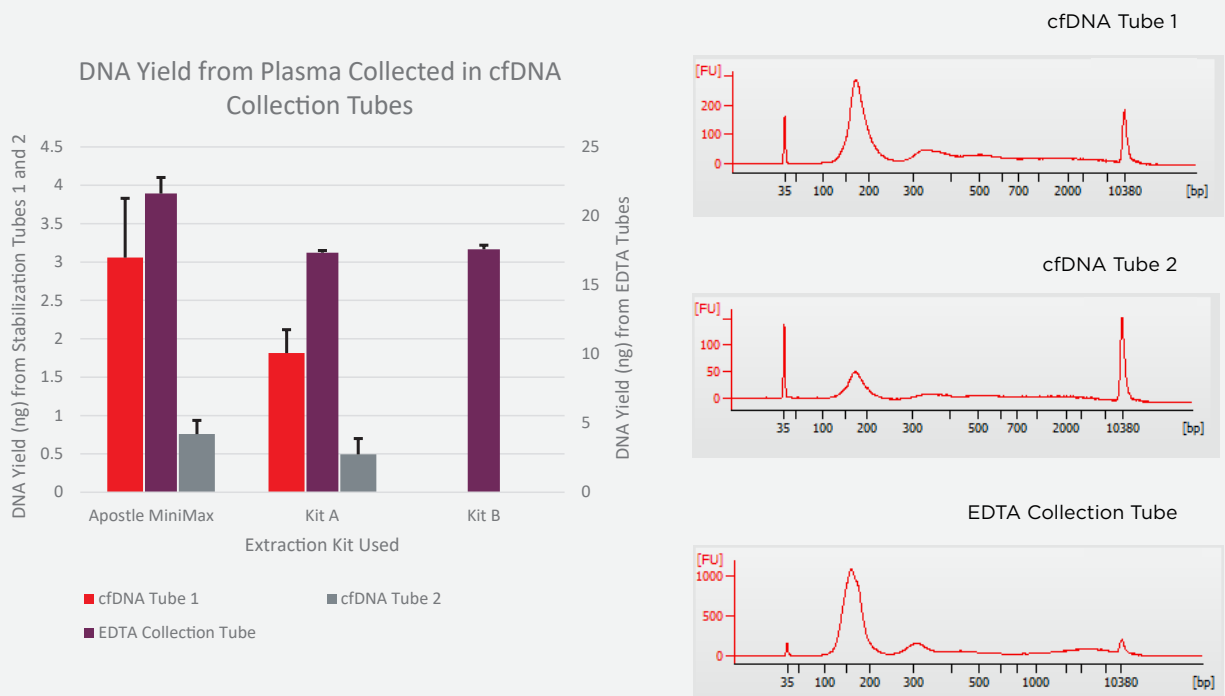


Figure 1. The Apostle MiniMax kit was used to extract DNA from 1 mL of plasma collected in 3 types of stabilization containers, referred to here as cfDNA Tube 1, EDTA Collection Tube, and cfDNA Tube 2. A market leading column-based kit (Kit A) was also used to extract DNA from 1 mL of plasma from cfDNA Tube 1, EDTA Collection Tube, and cfDNA Tube 2. A second bead-based kit (Kit B) was used to extract DNA from the EDTA Collection Tube. DNA yield was quantified using Quant-iT PicoGreen dsDNA assay kit (Thermo Fisher Scientific). The error bars represent the standard deviation of three technical replicates. For each tube type, the Apostle MiniMax kit extracted a higher total yield of DNA. DNA size was analyzed on an Agilent Bioanalyzer 2100. For all three tube types the Bioanalyzer traces indicate the DNA extracted correlates with the expected sizes of cfDNA (~170 bp).

Exceptional reproducibility

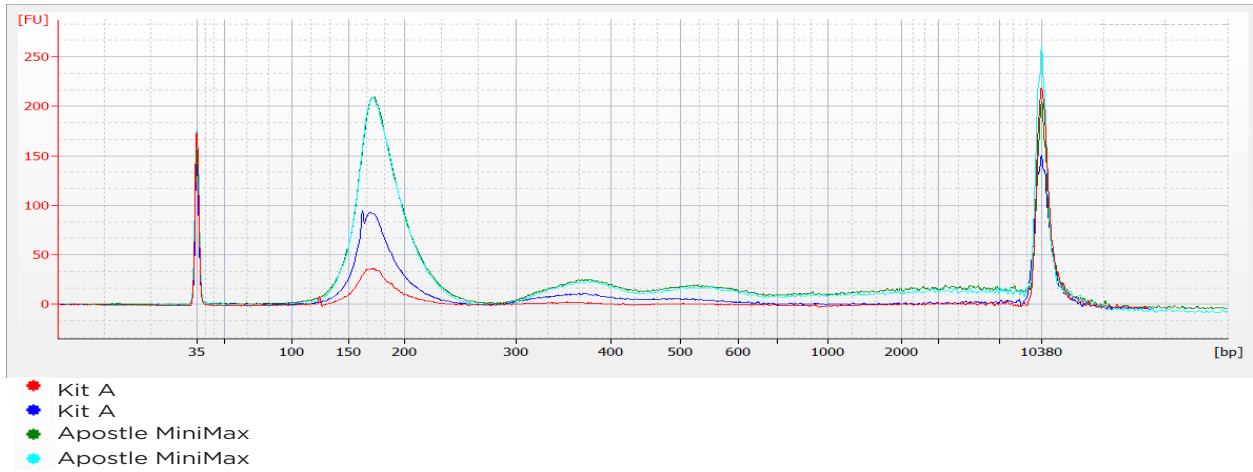


Figure 2. DNA was extracted from 1 mL of plasma collected in cfDNA Tube 1 using the Apostle MiniMax kit and one other kit (Kit A). These are technical replicates and both replicates extracted using the Apostle MiniMax kit are nearly identical. In contrast, the replicates extracted using Kit A have two distinct traces. Isolated cfDNA was characterized on an Agilent Bioanalyzer 2100; the peaks at 35 and 10380 bp are internal markers.

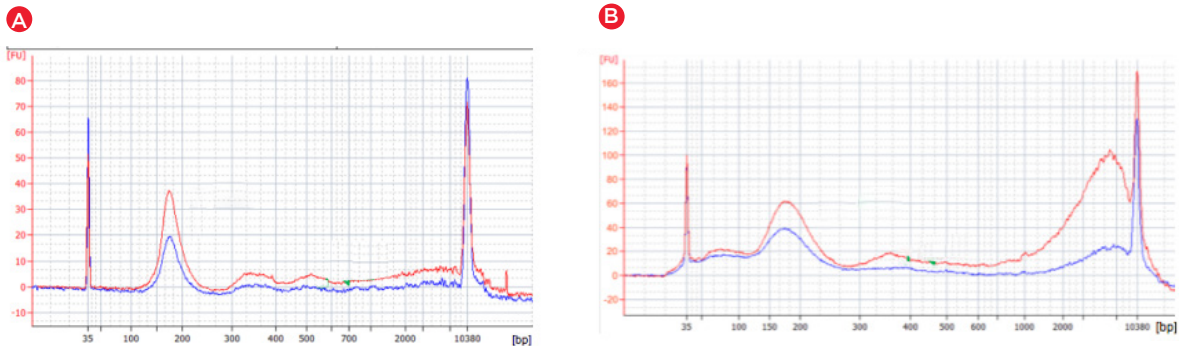
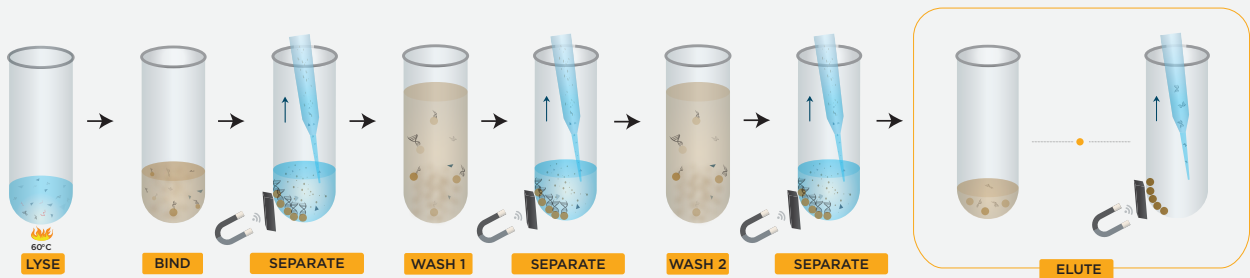


Figure 3. A) cfDNA was isolated from 4 mL of cell-free plasma with the Apostle MiniMax kit (red curve) and a market leading column-based kit (blue curve). The isolated cfDNA was characterized on an Agilent Bioanalyzer 2100. B) cfDNA was isolated from 20 mL of cell-free urine using the Apostle MiniMax kit (red curve) and a market leading column-based kit (blue curve). The isolated cfDNA was characterized on an Agilent Bioanalyzer 2100. The peaks at 35 and 10380 bp are internal markers. For both plasma and urine samples, the Apostle MiniMax kit outperformed the market leading column-based kit as indicated by higher peaks at ~170bp.



Workflow

- 1 Lyse plasma
- 2 Bind cfDNA to magnetic beads
- 3 Separate magnetic beads from contaminants
- 4 Wash magnetic beads with Wash Solution
- 5 Wash magnetic beads with 2nd Wash
- 6 Elute cfDNA from magnetic beads

Exceptional performance for DNA mutation detection and qPCR

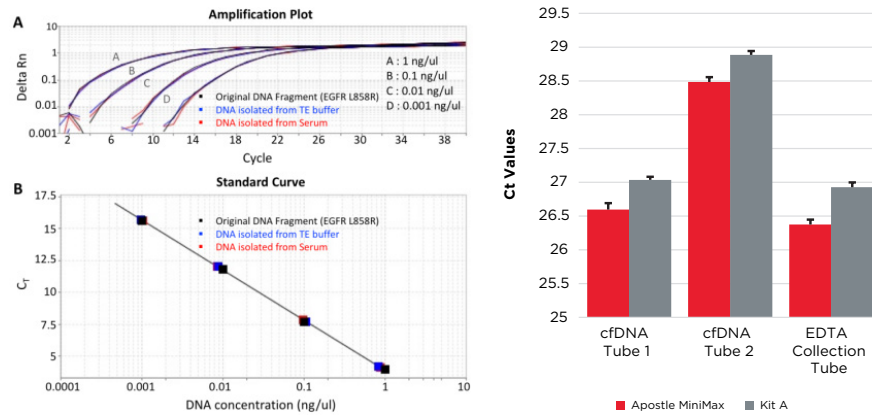


Figure 4. (Left) 20 μ L of a 170 bp synthetic DNA fragment containing the EGFR C2573T>G L858R mutation was spiked into 1 mL of TE buffer (blue) or serum (red) at concentrations ranging from 1 ng/ μ L to 0.001 ng/ μ L. The Apostle MiniMax kit was used to isolate the DNA fragments. A) The qPCR amplification plot shows highly overlapping curves for the isolated DNA fragments and the original synthetic DNA solution at the different concentrations. B) To quantify the amount of DNA that Apostle MiniMax can recover, a qPCR standard curve was generated using the original synthetic DNA solution. The DNA isolation recovery rate was calculated to be >90% for the Apostle MiniMax kit. (Right) qPCR performance was compared between Apostle MiniMax and one other market leading column-based kit (Kit A). Apostle MiniMax outperformed Kit A for DNA extracted from all three collection tubes presented.

DNA yield increases with input volume

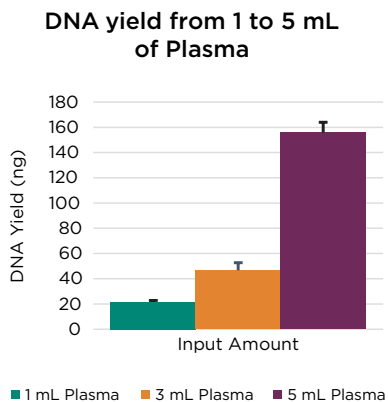


Figure 5. DNA was extracted from 1, 3, and 5 mL of plasma collected in EDTA tubes using the Apostle MiniMax kit. DNA yield was quantified by Quant-iT PicoGreen dsDNA assay kit (Thermo Fisher Scientific). Error bars represent the standard deviation of three technical replicates. The amount of DNA yielded from extraction with the Apostle MiniMax kit increases as the input volume increases.

Ready for use in manual or automated methods based on batch size or overall throughput

- Scalable based on throughput
- Quick transition with ready-to-implement methods
- Knowledgeable support for reagents, automation and methods from a single vendor

		Manual	Automated
24 samples	Hands-on Time	45 minutes	15 minutes
	Total Time	1 hour, 15 minutes	3 hours, 17 min
48 samples	Hands-on Time	NR	20 minutes
	Total Time	NR	4 hours, 47 min

Table 1. Estimated hands-on time and total time in hours and minutes required to perform 24 and 48 4 mL Apostle MiniMax cfDNA extractions. The methods can be performed either manually or automated on a liquid handling system. Data represented in this table is based on a Biomek i5 Multichannel instrument. NR = Not recommended.

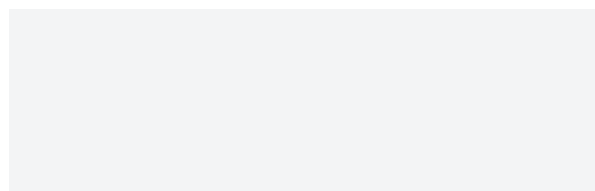
The Apostle MiniMax™ High Efficiency cfDNA Isolation Kit (Standard Edition) is available in 4 different configurations to accommodate your specific throughput needs.

Contact your local sales representative or visit beckman.com to request a quote.

Configurations

Part number	Description
C40604	cfDNA Isolation Kit - Apostle MiniMax™ High Efficiency - 10 Preps
C40603	cfDNA Isolation Kit - Apostle MiniMax™ High Efficiency - 50 Preps
C40605	cfDNA Isolation Kit - Apostle MiniMax™ High Efficiency - 5 mL x 50 Preps
C43459	cfDNA Isolation Kit - Apostle MiniMax™ High Efficiency - 4 mL x 384 Preps

For more information, please contact:



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