



Nucleic acid isolation

Elution into storage tubes on KingFisher purification systems with magnetic combi heads

Keywords

KingFisher Apex, nucleic acid isolation, protein purification, cell isolation, biobank storage, dual-head system

The Thermo Scientific™ KingFisher™ Apex Purification System is specifically designed for automated protein, nucleic acid, and cell sample preparation in 24-well, 96-well, and PCR plate formats. The dual magnet head feature of this system enables elution of purified material directly into storage tubes for use in downstream applications.

Introduction

The KingFisher Apex dual-head system was developed for eluting small volumes and elution into storage tubes for biobanking. The KingFisher Apex Purification System can accommodate 24 deep-well tip, 96 deep-well tip, 96 PCR tip, and 24 or 96 combi tip combs to prepare samples in 24-well or 96-well format.

The KingFisher Apex system can be purchased with four different magnetic heads, including a 96 combi head (Cat. No. 24079920), a 96 deep-well head (Cat. No. 24079930), a 96 PCR head (Cat. No. 2407910), and a 24 combi head (Cat. No. 24079940). The capacities, plate types, and recommended elution ranges for the 96 combi, 96 deep-well, and 24 combi heads are shown in Table 1. The type of plate needed depends on the extraction protocol and desired elution volume. Combi heads should be used for eluting volumes smaller than 50 µL or eluting into storage tubes. Although combi heads can fit plates that are not listed in Table 1, we do not recommend using different plates because this could compromise sample processing.

Table 1. Detailed comparison of the KingFisher Apex 96 Combi head, 96 DW head, and 24 Combi head.

Cat. No.	24079920	24079930	24079940
Description	KingFisher Apex 96 combi head	KingFisher Apex deep-well head	KingFisher Apex 24 combi head
Capacity	96 samples	96 samples	24 samples
Format	96-well	96-well	24-well
Processing volume	KingFisher plate	50–100 µL	NA
	Deep-well plate	15–1,000 µL	30–5,000 µL
	Storage tube	30–200 µL	NA
Plate type	96 KingFisher, 96 DW, 96 storage tube	96 KingFisher, 96 DW	24 DW, 24 storage tube
Number of magnetic rods	96	96	24
Magnetic head	96 combi head	96 DW	24

Combi tip combs should not be used for extraction or bead mixing, as they are designed solely for elution. Inefficient binding and mixing may occur if a combi head is used for the entire extraction workflow (Table 2).

Table 2. Intended uses for deep-well tip and combi tip combs.

Feature	Deep-well tip combs	Combi tip combs
24-well format	Yes	Yes
96-well format	Yes	Yes
Deep-well format for bead mixing and binding	Yes	No
Suitable for elution	Yes	Yes
Suitable for eluting into storage tubes	No	Yes
Suitable for eluting smaller volumes	No	Yes

To evaluate extraction efficiency with 24 and 96 combi tip combs on the KingFisher Apex system, 2 mL whole blood samples from two different donors were extracted using the Applied Biosystems™ MagMAX™ DNA Multi-Sample Ultra 2.0 Kit. Extractions were performed in triplicate using the 2 mL and 200 µL whole blood protocols, and samples were eluted into either a 24 deep-well plate or storage tubes. Samples were eluted on the Thermo Scientific™ KingFisher™ Flex Purification System using deep-well plates as a control. The total DNA yields were

quantified using an Invitrogen™ Qubit™ kit, and the total yields and purity ratios of the single-stranded DNA (ssDNA) were determined using a Thermo Scientific™ NanoDrop™ spectrophotometer.

Figure 1 shows results obtained using the 2 mL whole blood protocol. The yields and purity ratios of samples extracted on the KingFisher Flex system were comparable to those of samples extracted and eluted into a 24 deep-well plate or storage tubes on the KingFisher Apex system.

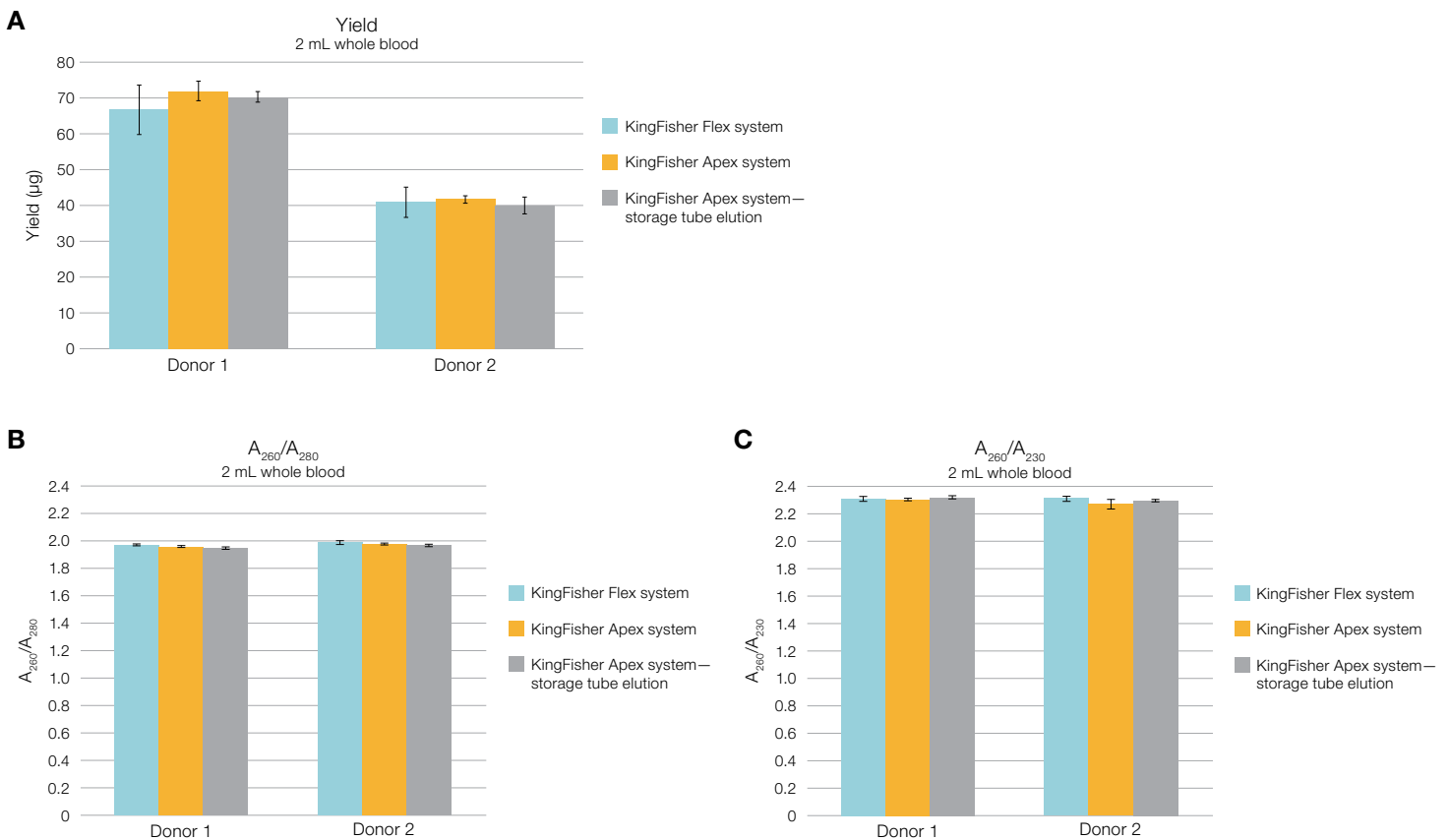


Figure 1. Extraction efficiencies of the KingFisher Flex and KingFisher Apex Purification Systems. (A) DNA yields obtained from two whole blood samples. The samples were processed using the MagMAX DNA Multi-Sample Ultra 2.0 Kit and the 2 mL whole blood protocol. (B) A_{260}/A_{280} and (C) A_{260}/A_{230} ratios of the extracts determined using a NanoDrop spectrophotometer.

Consistent purity ratios and total DNA yields were also obtained using the 200 μ L whole blood protocol regardless of format (Figure 2).

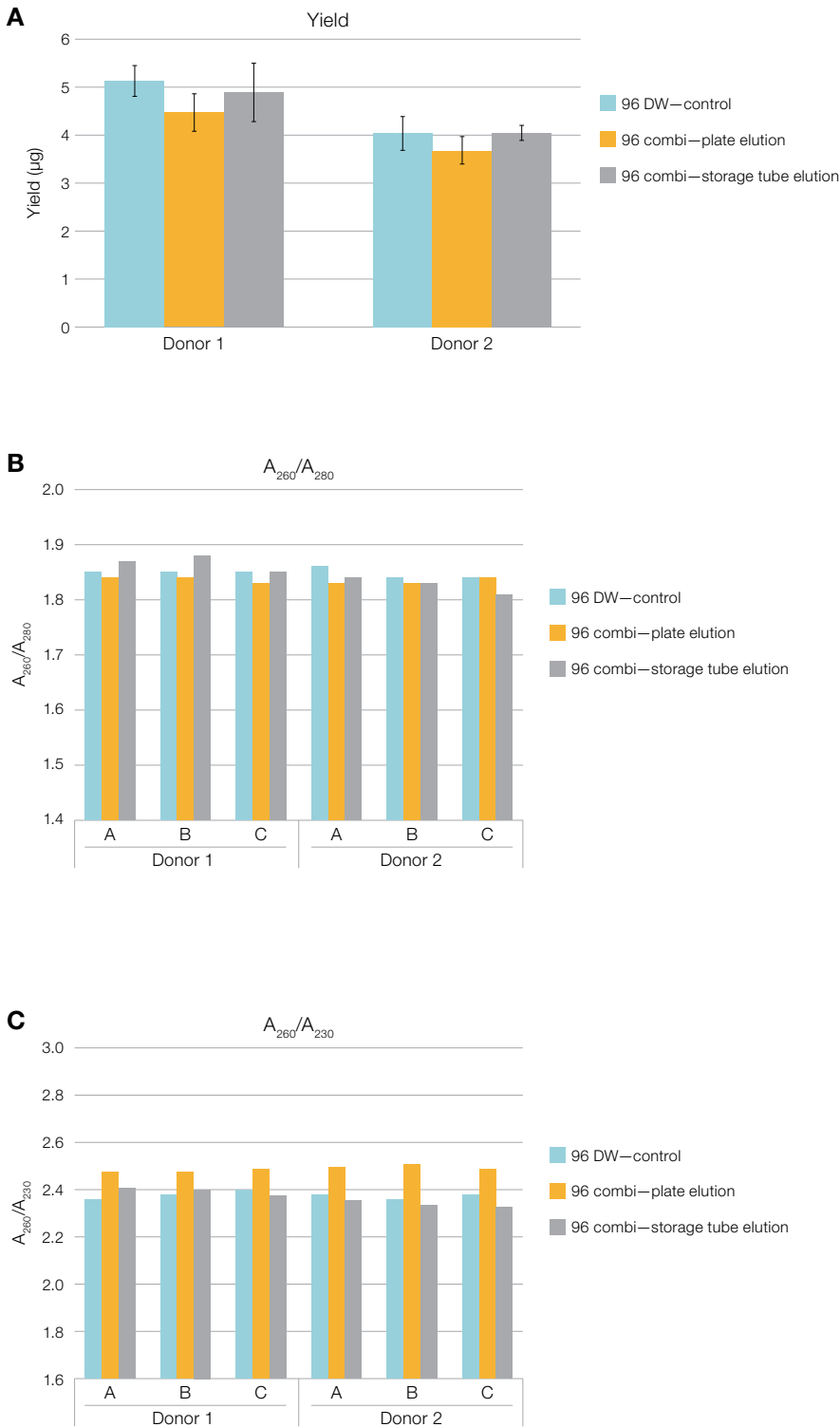


Figure 2. Extraction efficiency in 96-well and storage tube formats. (A) DNA yields in 100 μ L eluates after extraction from whole blood using the 200 μ L whole blood protocol for the MagMAX DNA Multi-Sample Ultra 2.0 Kit. **(B)** A_{260}/A_{280} and **(C)** A_{260}/A_{230} ratios of the extracts determined using a NanoDrop spectrophotometer.

Conclusion

To elute into storage tubes on the KingFisher Apex Purification System fitted with a 24 or 96 combi head, we recommend using deep-well tips for the extraction and wash steps and switching to combi tips just before the drying step. This prevents potential mixing and binding issues and provides the benefits of the combi design for eluting smaller volumes into smaller spaces. Using Thermo Scientific™ Bindlx™ Software for the KingFisher Apex Purification System, you are able to create the best script for your laboratory needs.

Ordering information

Description	Quantity	Cat. No.
KingFisher Apex Purification Systems		
KingFisher Apex system with 96 PCR head	1	5400910
KingFisher Apex system with 96 combi head	1	5400920
KingFisher Apex system with 96 DW head	1	5400930
KingFisher Apex system with 24 combi head	1	5400940
KingFisher Apex accessories		
KF Apex 96 PCR head	1	24079910
KF Apex 96 combi head	1	24079920
KF Apex 96 DW head	1	24079930
KF Apex 24 combi head	1	24079940
KF Apex PCR heating block	1	24075910
KF Apex 96 KF heating block	1	24075920
KF Apex 96 DW heating block	1	24075930
KF Apex 24 DW heating block	1	24075940
KF Apex 96 storage tube heating block	1	24075950
KF Apex 24 storage tube heating block	1	24075960

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