MACHEREY-NAGEL

NucleoMag® Blood 3 mL

Automated purification of genomic DNA from 3 mL blood samples on the platform KingFisher® Flex

TaKaRa
Available from and supported by Takara Bio USA, Inc.

Introduction

The isolation of genomic DNA from whole blood samples is an initial and crucial step for various diagnostic workflows. Clinical applications such as genotyping, HLA typing, biomarker discovery, newborn screening, and pharmacogenetics are widely performed in laboratories worldwide. To enable a state of the art molecular diagnostic, the sensitivity and performance of biomolecular detection methods like qPCRs, next-generation sequencing, and microarray analysis, is constantly improved. A main aspect to face these workflow requirements, is to facilitate the extraction of highly pure DNA in substantial amounts. To provide a fast and consistent sample processing, MACHEREY-NAGEL designed the NucleoMag® Blood 3 mL kit, specialized for automated purification of genomic DNA from 3 mL whole blood samples (fresh or frozen, EDTA or citrate treated) in a 24-well format. The kit provides reagents and magnetic beads for isolation of genomic DNA from 96 samples of up to 3 mL. An optimized protocol allows the processing of 24 samples each with a volume of 3 mL within 60 minutes including a sample lysis on the KingFisher® platform.

Products at a glance

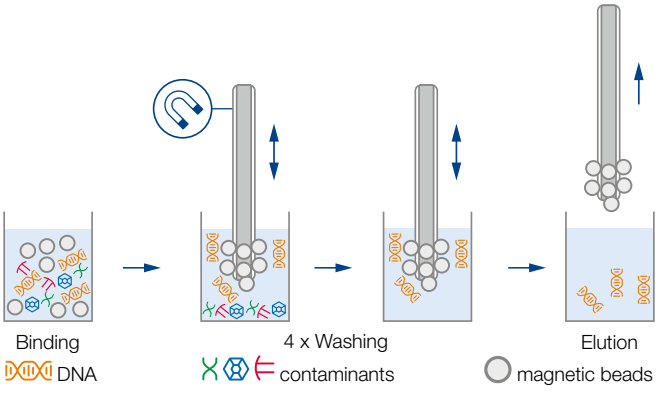
NucleoMag® Blood 3 mL	
Technology	Magnetic bead technology
Sample material	≤ 3 mL whole blood (fresh or frozen, EDTA or citrate treated)
Preparation time	Approx. 60 min on KingFisher® Flex for 24 samples including samples lysis
Typical yield	100–130 µg (3 mL blood; depending on sample quality)
Elution volume	1000 µL
Binding capacity	0.4 µg/µL beads

King Fisher® Flex	
Sample volume	20–5000 µL
Capacity	24/96 samples (8 plates per deck)
Heating / cooling	4–96 °C
Size / weight	60 x 38 x 68 cm / 28 kg

Material and Methods

The NucleoMag® Blood 3 mL kit can be processed completely at room temperature. Whole blood (fresh, frozen, treated with EDTA or citrate) is lysed at room temperature with Lysis Buffer MBL1 and Proteinase K. Following lysis incubation, binding of DNA to the NucleoMag® B-Beads is achieved by the provision of Binding Buffer MBL2.

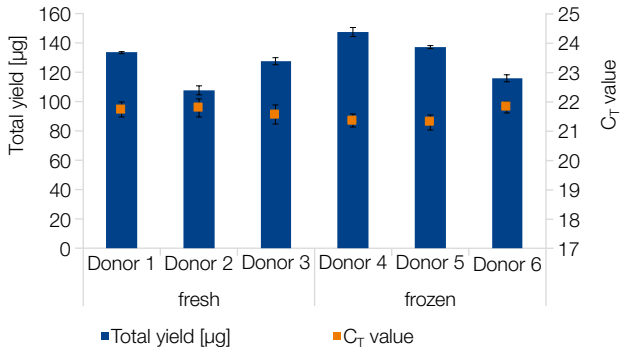
Subsequent DNA isolation is performed on the automation platform KingFisher® Flex. The isolation principle is based on reversible adsorption of nucleic acids to paramagnetic NucleoMag® B-Beads under appropriate buffer conditions.



Workflow on automation platform

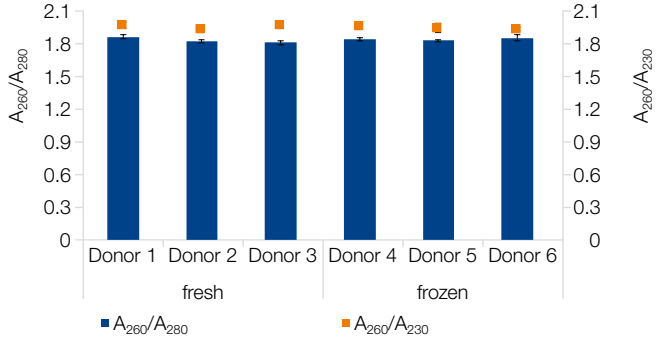
After magnetic separation, the NucleoMag® B-Beads are washed four times to remove contaminants and salts using three different wash buffers (MBL3, 80 % ethanol and MBL4). Highly pure genomic DNA is finally eluted under low ionic strength conditions in a slightly alkaline elution buffer (MBL5).

Application data



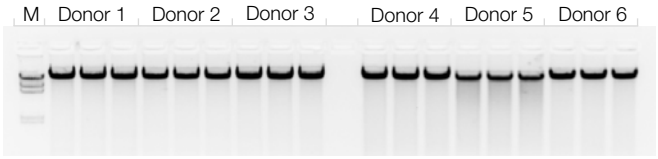
Isolation of genomic DNA from fresh and frozen human blood samples

DNA was isolated from fresh and frozen 3 mL human blood samples (n = 4) using the NucleoMag® Blood 3 mL kit on a KingFisher® Flex platform. The total yield was determined by UV-spectrometry (dark blue bars) resulting to an average yield between 100–130 µg of nucleic acid. A subsequent qPCR analysis (orange squares) was performed with a Taqman® Probe for a 250 bp ß-Actin amplicon using the SensiFast™ Probe Lo-ROX kit from Bioline on an Applied Biosystems® 7500 Real-Time PCR System.



Purity of isolated nucleic acids

DNA was isolated from fresh and frozen 3 mL human blood samples (n = 4) using the NucleoMag® Blood 3 mL kit on a KingFisher® Flex platform. The purity was determined by UV-spectrometry resulting into an average A_{260}/A_{280} value of 1.83 ± 0.2 (dark blue bars) and into an average A_{260}/A_{230} value (orange squares) of 1.95 ± 0.15.



Integrity of isolated nucleic acids

The integrity of the isolated nucleic acids from fresh (donor 1–3) and frozen (donor 4–6) blood samples was analyzed by gel electrophoresis (10 µl per eluate; 1 % TAE-gel; M: Lambda DNA/Hind III – Thermo Scientific).

Automate your DNA extraction from 3 mL blood samples

MACHEREY-NAGEL delivers a ready to go solution for your high throughput DNA extraction from various blood samples, such as fresh, frozen, treated with EDTA or citrate. We adapted the NucleoMag® Blood 3 mL kit on instruments of the KingFisher® series to speed up your nucleic acid purification workflow.

- Reliable performance and excellent yields from various blood sample material
- Speed up your DNA extraction by processing of 24 blood samples with a volume of 3 mL in 60 minutes (including sample lysis)

Ordering information

Product	Specifications	Preps	REF
NucleoMag® Blood 3 mL	Kit based on magnetic bead technology for the isolation of genomic DNA from 3 mL blood samples including NucleoMag® B-Beads, buffers, and Proteinase K	1 x 96	744502.1
KingFisher® 24 Accessory Kit*	Accessory kit for 5 x 24 preps with NucleoMag Blood 3 mL kit using a KingFisher Flex 24 platform containing KingFisher 24 Deep-well Plates (35), KingFisher 24 Flex Tip Comb (5)	5 x 24	744953

*For use on KingFisher® Flex