



Automation



Tailor-made automation solutions...

- We care for you! MACHEREY-NAGEL supports your complete application

One-Stop-Shopping at MACHEREY-NAGEL...

- KingFisher® instruments ready-to-go with optimized NucleoMag® technology

MACHEREY-NAGEL

www.mn-net.com



A matched teamwork: NucleoMag® technology on KingFisher® instruments

MACHEREY-NAGEL and Thermo Scientific™ have cooperated to deliver ready-to-go solutions for high-throughput purification of nucleic acids: The adaption of the unique NucleoMag® technology on KingFisher® instruments.

Your benefits:

- One-Stop-Shopping at MACHEREY-NAGEL, including instrument, kits, and plastics
- Platforms pre-programmed with NucleoMag® protocols
- Easy programming with the new BindIt™ software
- Shortened procedures due to optimized NucleoMag® protocols
- Highly reliable purification of nucleic acids
- Flexibility due to scalability
- Support for the whole system by the MN-HTP team: pm-bio@mn-net.com

Choose your system: KingFisher® Duo Prime and KingFisher® Flex



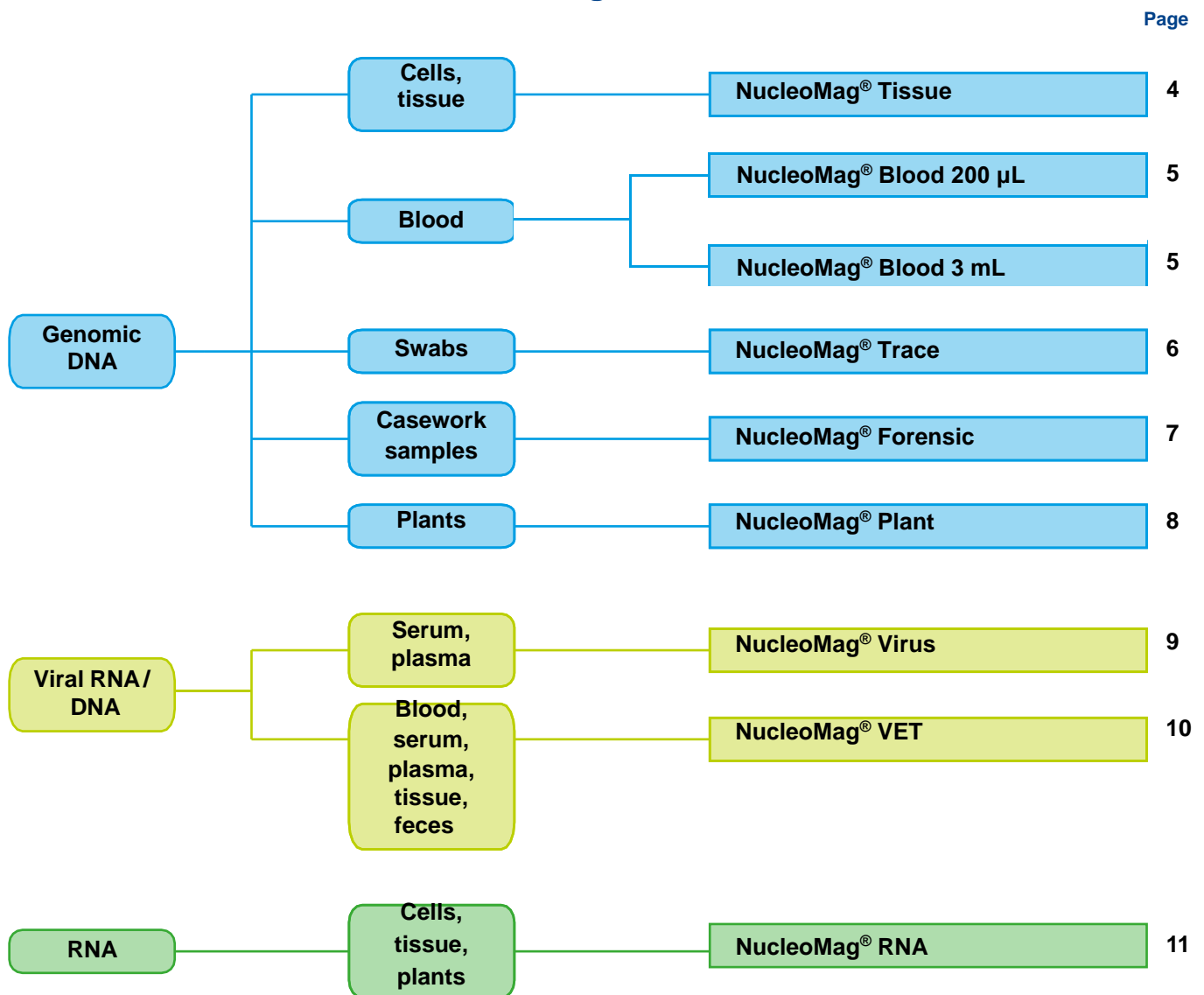
| | KingFisher® Duo Prime | KingFisher® Flex |
|---|--|--|
| REF | 746030 | 746020 |
| Sample Volume | 50–5000 µL | 20–5000 µL |
| Elution Volume | 30–130 µL | 20–100 µL |
| Capacity (Samples per run) | 6 / 12 | 24 / 96 |
| Plates per deck | 2 | 8 |
| Plate types | KingFisher® 24 Deep-well plate KingFisher® 96 Deep-well plate | KingFisher® 24 Deep-well plate KingFisher® 96 Elution plate KingFisher® 96 Deep-well plate |
| Heating/Cooling | 4–75 °C | 4–96 °C |
| Collection efficiency of magnetic particles | > 95 % | > 95 % |
| Display | LCD color display | LCD color display |
| Internal memory | Space for approx. 200 protocols | Space for up to 100 protocols |
| Computer interface | USB | USB or serial port |
| Size metric | 46 x 45 x 40 cm | 60 x 38 x 68 cm |
| Size inch | 18.1 x 17.7 x 15.8 in. | 23.6 x 15 x 26.8 in. |
| Weight | 16 kg / 35 lbs. | 28 kg / 62 lbs. |
| Special Features | <ul style="list-style-type: none"> • Built-in UV-lamp (8 W) for a standardized and efficient decontamination • Optional barcode reader for a traceable documentation • Able to save run-log-files | <ul style="list-style-type: none"> • Can be integrated into liquid handling systems |

Accessory kits for NucleoMag® on KingFisher® instruments

MN provides accessory kits containing tip combs, blocks, and plates which can be used in combination with NucleoMag® kits. The KingFisher® Accessory Kits are tailored for each instrument and the respective application.

| Product | Specifications | REF |
|--|---|--------|
| KingFisher® Accessory Kit A | Deep-well Plates, Deep-well Tip Combs, and Elution Plates for 4 x 96 NucleoMag® Tissue / Trace / Forensic / Virus / VET preps using the KingFisher® Flex platform | 744950 |
| KingFisher® Accessory Kit B | Deep-well Plates, Deep-well Tip Combs, and Elution Plates for 4 x 96 NucleoMag® Blood 200 µL / Plant / RNA preps using the KingFisher® Flex platform | 744951 |
| KingFisher® 24 Accessory Kit | Deep-well Plates and Tip Combs for processing NucleoMag® kits in 24-well format on KingFisher® Flex platform | 744953 |
| KingFisher® Duo Prime Accessory Kit | Deep-well Plates, Tip Combs and Elution Strips for processing in 96-well format on KingFisher® Duo Prime platform | 744952 |

MACHEREY-NAGEL Kit Finder for KingFisher® Duo Prime/Flex



NucleoMag® Tissue

Isolation of DNA from tissue, cultured cells, or bacteria

XReliable DNA purification for reproducible results

Highly pure DNA ready-to-use for various applications, e.g., genotyping

XConsistent DNA yield

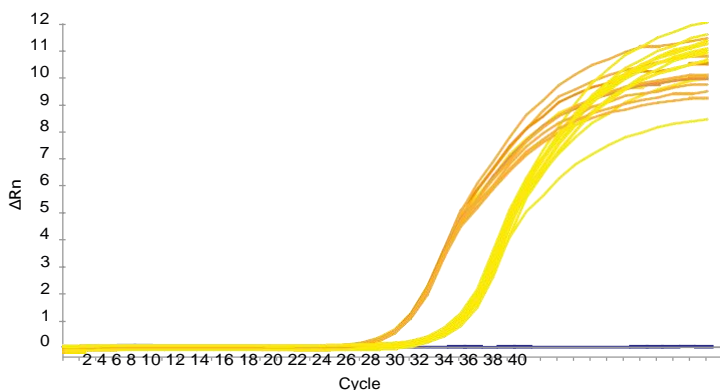
XFast procedure

25 min process at room temperature

Product at a glance

| | |
|--------------------------------|---|
| Sample material | < 20 mg human / animal tissue, < 10 ⁶ human / animal cells or bacteria |
| Fragment size | 300 bp–50 kbp |
| Typical yield | 10–20 µg (20 mg tissue) |
| Elution volume | 50–200 µL |
| Processing time on KingFisher® | 25 min (excluding lysis) |

Application data



DNA purification from mouse tail samples

DNA was purified from 10 mg mouse tail samples on KingFisher® Duo / Duo Prime. Purified DNA was diluted 1:10 and 1:100. The beta actin gene was amplified using an ABI 7500 Thermocycler, Biorun SensiMix™ II Probe kit.

The amplification curves are parallel to each other in the exponential phase, indicating that the amplification efficiency is independent from amount of DNA.

- Mouse tail 1:10
- Mouse tail 1:100

Reference

Merckx K., et al.

Evolution of endemism on a young tropical mountain

Nature. 2015 Aug; 524 (7565): 347-50

Mattila A., et al.

High genetic load in an old isolated butterfly population

Proc Natl Acad Sci USA. 2012 Sep; 109 (37): E2496-505

Ordering information

| Product | Preps | REF |
|-------------------|---------------------------|---------------------|
| NucleoMag® Tissue | 1 x 96 / 4 x 96 / 24 x 96 | 744300.1 / .4 / .24 |

NucleoMag® Blood 200 µL • NucleoMag® Blood 3 mL

DNA isolation from 200 µL and up to 3 mL blood sample

X Outstanding quality of ready-to-use DNA

Efficient removal of inhibitors

X Consistent high DNA yields

Up to 8 µg DNA from 200 µL whole blood and 130 µg DNA from 3 mL whole blood

X Convenient handling

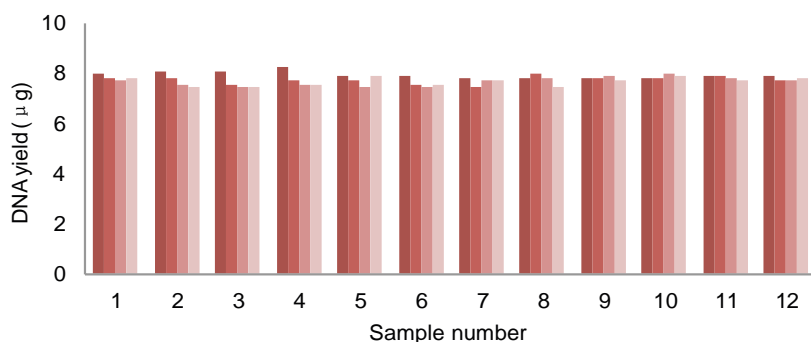
Complete process at room temperature

Choose the required format: Processing of small and large blood samples

Product at a glance

| | NucleoMag® Blood 200 µL | NucleoMag® Blood 3 mL |
|---------------------------------------|--|--|
| Sample material | < 200 µL whole blood (fresh, frozen, EDTA, or citrate treated) | < 3 mL whole blood (fresh, frozen, EDTA, or citrate treated) |
| Fragment size | 300 bp–50 kbp | 300 bp–50 kbp |
| Typical yield | 2–8 µg (200 µL blood) | 100–130 µg (3 mL blood) |
| Elution volume | 50–100 µL | 1000 µL |
| Processing time on KingFisher® | 39 min | 60 min |

Application Data



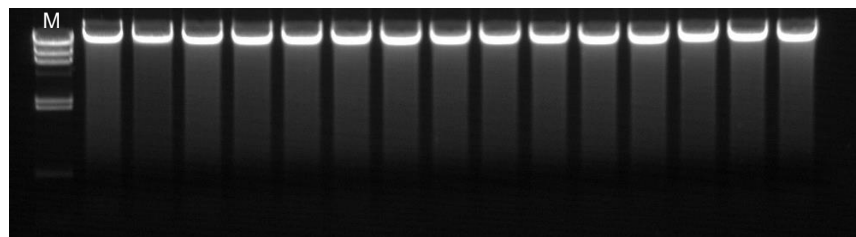
Run to run consistency

Genomic DNA was purified from whole blood samples by NucleoMag® Blood 200 µL on the KingFisher® Duo / Duo Prime system. Four runs were performed with each sample and DNA was purified with high consistency.

- Run 1
- Run 2
- Run 3
- Run 4

Reliable DNA purification

Agarose gel electrophoresis of DNA purified from blood samples with NucleoMag® Blood 200 µL on KingFisher® Duo / Duo Prime. The NucleoMag® Blood kits enable consistent purification of high molecular weight DNA even from challenging whole blood samples.



Reference

Kreuels B., et al.

Differing effects of HbS and HbC traits on uncomplicated falciparum malaria, anemia, and child growth

Blood. 2010 Jun; 115 (22): 4551-8

Schuldt K., et al.

A -436C>A Polymorphism in the Human FAS Gene Promoter Associated with Severe Childhood Malaria

PLoS Genet. 2011 May; 7 (5): E1002066

Ordering information

| Product | Preps | REF |
|-------------------------|-----------------|---------------|
| NucleoMag® Blood 200 µL | 1 x 96 / 4 x 96 | 744501.1 / .4 |
| NucleoMag® Blood 3 mL | 1 x 96 | 744502.1 |



NucleoMag® Trace

DNA isolation from buccal swabs (for database storage)

X Purification of highly concentrated DNA

Yield is not affected by variation of the elution volume

X Efficient removal of inhibitors

DNA ready-to-use for e.g., PCR, STR analysis, or any kind of enzymatic reaction

Product at a glance

| | |
|--------------------------------|--|
| Sample material | Buccal swabs |
| Fragment size | Depending on sample amount and quality |
| Typical concentration | 10–30 ng/μL |
| Elution volume | 50–200 μL |
| Processing time on KingFisher® | 21 min |

Reference

Verscheure S., et. al.

Coding region SNP analysis to enhance dog mtDNA discrimination power in forensic casework.

Forensic Sci Int Genet. 2015 Jan; 14: 86-95.

Witt S., et al.

Establishing a novel automated magnetic bead-based method for the extraction of DNA from a variety of forensic samples

Forensic Sci Int Genet. 2012 Sep; 6 (5): 539-47



Ordering information

| Product | Preps | REF |
|------------------|---------------------------|---------------------|
| NucleoMag® Trace | 1 x 96 / 4 x 96 / 24 x 96 | 744600.1 / .4 / .24 |



NucleoMag® Forensic

DNA isolation from forensic samples (e.g., casework samples, contact traces)

X High sensitivity even for low DNA content

Elution volume as small as 25 µL possible

X Efficient DNA isolation from all casework samples and contact traces

Suitable for dried blood spots, cigarette filters, swabs, and chewing gum

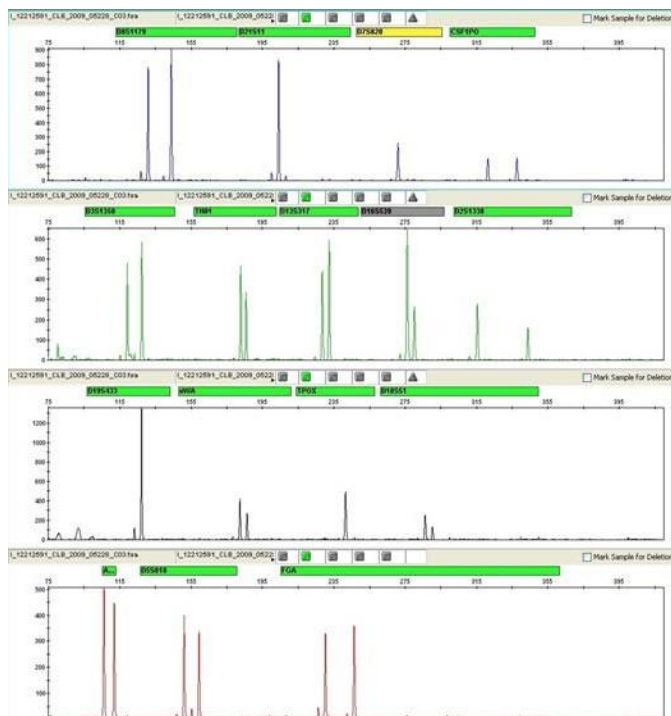
X Excellent DNA quality for typical downstream applications

No inhibition of downstream applications for a broad range of starting materials

Product at a glance

| | |
|---------------------------------------|--|
| Sample material | Casework samples, contact traces (e.g., dried blood spots, cigarette filters, swabs) |
| Typical yield | Depends on sample amount and quality |
| Typical concentration | Approximately 1 ng/µL |
| Elution volume | 25–50 µL |
| Processing time on KingFisher® | 48 min |

Application data



STR analysis of purified DNA samples

Genomic DNA has been extracted from a cigarette butt, using the NucleoMag® Forensic kit. DNA profiling was performed in a Multiplex PCR with the AmpFLSTR® PCR Amplification Kit (Applied Biosystems). Sequencing and subsequent analysis was performed on a Genetic Analyzer with the GeneMapper® software (Applied Biosystems). STR analysis revealed defined peaks for all tested loci.

Ordering information

| Product | Preps | REF |
|---------------------|-----------------|---------------|
| NucleoMag® Forensic | 1 x 96 / 4 x 96 | 744650.1 / .4 |

NucleoMag® Plant

DNA isolation from plant materials

XSuitable for a broad range of plant samples

XDNA isolation from plants in less than 25 min

XPurification of highly concentrated DNA

Yield is not affected by variation of the elution volume

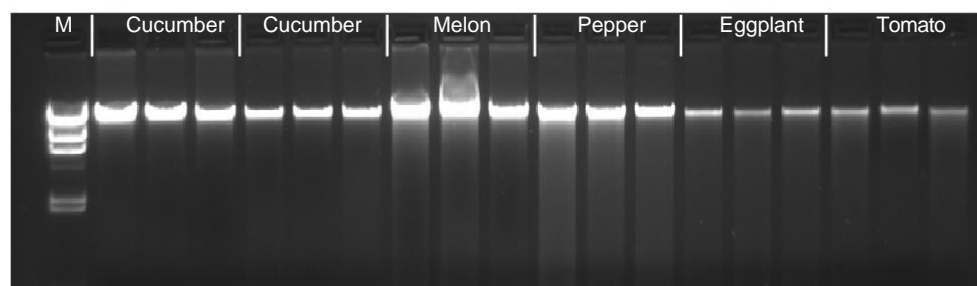
XDNA directly suitable for downstream applications

Efficient removal of inhibitors

Product at a glance

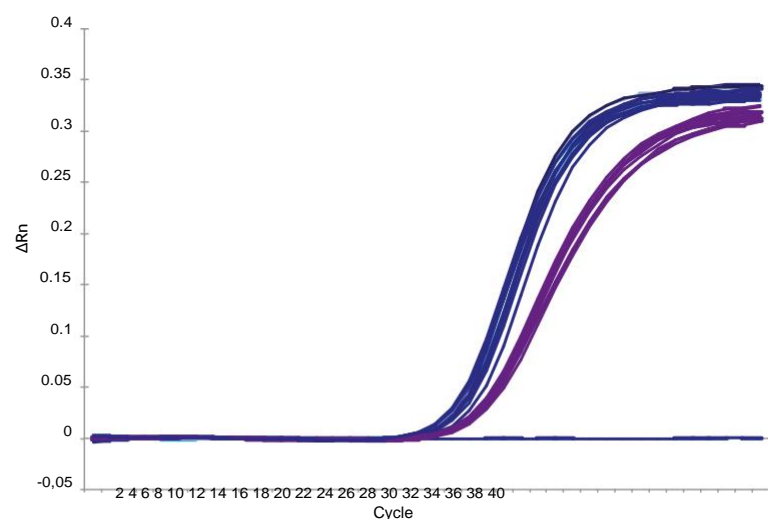
| | |
|---------------------------------------|---|
| Sample material | 20–50 mg plant tissue (wet weight) |
| Fragment size | 300 bp–50 kbp |
| Typical yield | 10–20 µg (50 mg plant tissue, wet weight) |
| Elution volume | 50–200 µL |
| Processing time on KingFisher® | 22 min (excluding lysis) |

Application data



Efficient DNA purification from different plant seed samples

Genomic DNA was extracted from one seed grain per extraction using NucleoMag® Plant kit on KingFisher® Flex. The disruption was performed using a mixer mill with steel beads (4 mm bead, 5 min, 30 Hz).



Reproducible quality

DNA purified with the NucleoMag® Plant kit is amplifiable without any inhibition. qRT-PCR results show that the contaminating substances are removed efficiently during the process, resulting in high-quality DNA.

- ♻ Maize samples
- ♻ Wheat samples

Reference

Merckx K., et al.
Evolution of endemism on a young tropical mountain
 Nature. 2015 Aug; 524 (7565): 347-50

Ordering information

| Product | Preps | REF |
|------------------|---------------------------|---------------------|
| NucleoMag® Plant | 1 x 96 / 4 x 96 / 24 x 96 | 744400.1 / .4 / .24 |



NucleoMag® VET

Viral RNA / DNA and bacterial DNA from veterinary samples

X Reliable detection of RNA and DNA viruses even from low titers

E.g., BTV, pCV, SBV, CSFV

X Consistent isolation of DNA from hard-to-lyse bacteria

E.g., *Chlamydia*, *Mycobacterium avium* / tuberculosis

X Suitable for typical samples applied in veterinary diagnostics

E.g., whole blood, serum, plasma, tissue, feces, swab solution

X Optimized protocols for efficient lysis of various sample materials

All-round kit for veterinary diagnostics

Product at a glance

| | |
|------------------------|--|
| Sample material | < 200 µL whole blood, serum, plasma, < 10–30 mg tissue (e.g., ear notches), < 200 µL feces, < 200 µL swab wash solution |
|------------------------|--|

| | |
|--|------------------------------------|
| Maximum amount of sample material | 200 µL liquid / homogenized sample |
|--|------------------------------------|

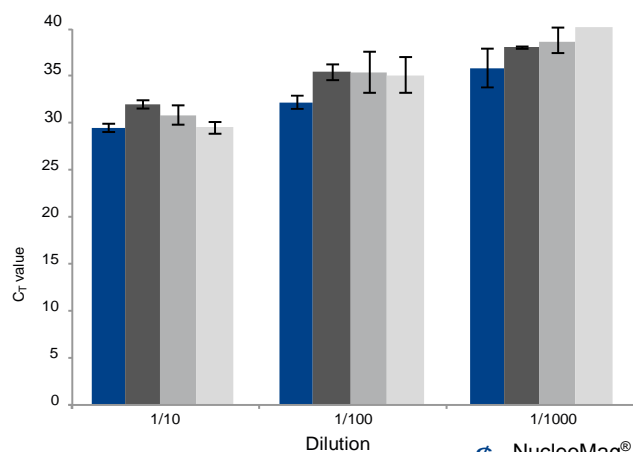
| | |
|----------------------|---------------|
| Fragment size | 300 bp–50 kbp |
|----------------------|---------------|

| | |
|-----------------------|-----------|
| Elution volume | 50–100 µL |
|-----------------------|-----------|

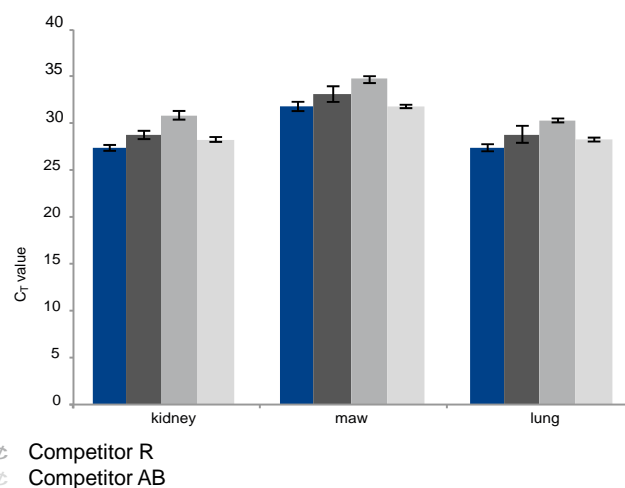
| | |
|---------------------------------------|----------------------|
| Processing time on KingFisher® | Approximately 40 min |
|---------------------------------------|----------------------|

Application data

A: Virus in serum



B: Bacteria in tissue



Pathogen-detection in veterinary samples.

(A) Bovine serum was diluted as indicated and nucleic acids were purified with four different kits on the KingFisher® Flex platform. Schmallenberg virus (SBV) was detected by RT-qPCR, showing highest detection sensitivity after purification with the NucleoMag® VET kit.

(B) Nucleic acids were isolated from various organs and subsequently subjected to a qPCR-based detection of Chlamydiae. In comparison to competitor products, a maximum of detection-sensitivity was achieved in samples, which were purified with the NucleoMag® VET kit.

Data kindly provided by the Friedrich-Loeffler-Institute (FLI), Greifswald, Germany.

Reference

Schulz C., et al.

European interlaboratory comparison of Schmallenberg virus (SBV) real-time RT-PCR detection in experimental and field samples: The method of extraction is critical for SBV RNA detection in semen

J Vet Diagn Invest. 2015 Jul; 27 (4): 422-30

Ordering information

| Product | Preps | REF |
|----------------|-----------------|---------------|
| NucleoMag® VET | 1 x 96 / 4 x 96 | 744200.1 / .4 |

NucleoMag® Virus
Viral RNA / DNA from cell-free biological fluids

XReliable and sensitive detection of viral RNA and DNA

Carrier RNA and Proteinase K for efficient release of viral nucleic acids included

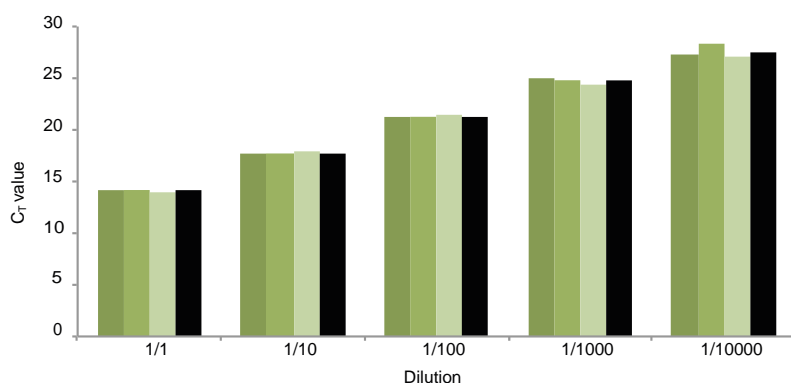
XPurification of highly concentrated nucleic acids

Small elution volume $\geq 50 \mu\text{L}$

Product at a glance

| | |
|---------------------------------------|---|
| Sample material | < 200 μL cell-free biological fluids (e.g., serum, plasma) |
| Typical yield | Depending on sample amount and quality |
| Elution volume | 50–100 μL |
| Processing time on KingFisher® | Approximately 35 min |

Application data



Detection of HCV from serum samples

A dilution series of a hepatitis C (HCV) positive sample was prepared. From each dilution three extractions were performed using the KingFisher® Flex instrument. In all samples the viral RNA could be detected with high consistency and high sensitivity.

- ☐ Run 1
- ☐ Run 2
- ☐ Run 3
- ☐ Mean value

Reference

Lelli D., et al.
Detection of Coronaviruses in Bats of Various Species in Italy
 Viruses. 2013 Oct; 5 (11): 2679-89

Ordering information

| Product | Preps | REF |
|-------------------------|-----------------|---------------|
| NucleoMag® Virus | 1 x 96 / 4 x 96 | 744800.1 / .4 |

 **NucleoMag® RNA**
RNA purification from cells and tissue

X Purification of high quality RNA even from difficult samples

Recombinant rDNase for genomic DNA removal included

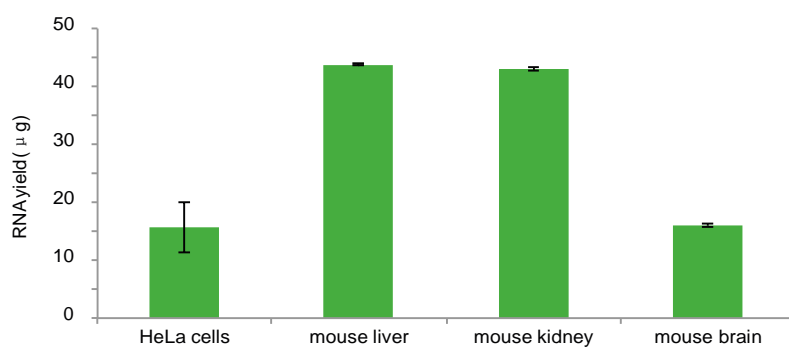
X No use of malodorous agents such as beta-mercaptoethanol

Reducing agent TCEP included

Product at a glance

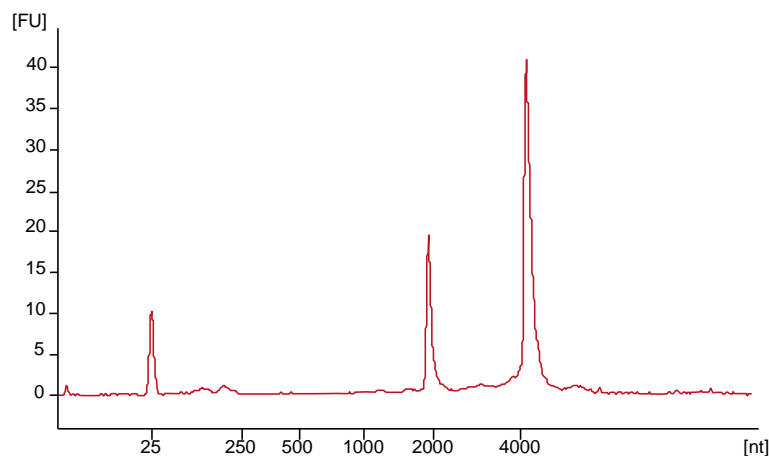
| | |
|---------------------------------------|---|
| Sample material | < 2 x 10 ⁶ cultured cells, < 20 mg human / animal tissue |
| Fragment size | > 200 nt |
| Typical yield | < 30 µg |
| Elution volume | 50–200 µL |
| Processing time on KingFisher® | 60 min |

Application data



Reliable RNA purification from various starting materials

RNA was purified from 10⁶ HeLa cells, 25 mg mouse liver, 25 mg mouse kidney, and 20 mg mouse brain with NucleoMag® RNA on KingFisher® Duo / Duo Prime instrument. High yield of RNA were efficiently purified from all samples.



Purification of high-quality RNA

Exemplary RNA profile of a sample purified with NucleoMag® RNA from 10⁶ HeLa cells on KingFisher® Flex. The sample shows the characteristic pattern of an eukaryotic transcriptome. The purified RNA exhibited a high quality (RIN >9).

Reference

Padilla J., et al.
Transcriptome-wide RNA sequencing analysis of rat skeletal muscle feed arteries. II. Impact of exercise training in obesity
J Appl Physiol. 2014 Apr; 116 (8): 1033-47

Ordering information

| Product | Preps | REF |
|----------------|-----------------|---------------|
| NucleoMag® RNA | 1 x 96 / 4 x 96 | 744350.1 / .4 |

Ordering information

| KingFisher® instruments | Specifications | REF |
|---|---|---------------------|
| KingFisher® Duo Prime | Instrument for magnetic bead-based nucleic acid extraction in 2-plate format | 746030 |
| KingFisher® Flex | Instrument for magnetic bead-based nucleic acid extraction in 8-plate format | 746020 |
| NucleoMag® kits for KingFisher® instruments | Preps | REF |
| NucleoMag® Tissue | 1 x 96 / 4 x 96 / 24 x 96 | 744300.1 / .4 / .24 |
| NucleoMag® Blood 200 µL | 1 x 96 / 4 x 96 | 744501.1 / .4 |
| NucleoMag® Blood 3 mL | 1 x 96 | 744502.1 |
| NucleoMag® Trace | 1 x 96 / 4 x 96 / 24 x 96 | 744600.1 / .4 / .24 |
| NucleoMag® Forensic | 1 x 96 / 4 x 96 | 744650.1 / .4 |
| NucleoMag® Plant | 1 x 96 / 4 x 96 / 24 x 96 | 744400.1 / .4 / .24 |
| NucleoMag® Virus | 1 x 96 / 4 x 96 | 744800.1 / .4 |
| NucleoMag® VET | 1 x 96 / 4 x 96 | 744200.1 / .4 |
| NucleoMag® RNA | 1 x 96 / 4 x 96 | 744350.1 / .4 |
| Accessory kits | Specifications | REF |
| KingFisher® Accessory Kit A | Deep-well Plates, Deep-well Tip Combs, and Elution Plates for 4 x 96 NucleoMag® Tissue / Trace / Forensic / Virus / VET preps using the KingFisher® Flex platform | 744950 |
| KingFisher® Accessory Kit B | Deep-well Plates, Deep-well Tip Combs, and Elution Plates for 4 x 96 NucleoMag® Blood 200 µL / Plant / RNA preps using the KingFisher® Flex platform | 744951 |
| KingFisher® 24 Accessory Kit | Deep-well Plates and Tip Combs for processing NucleoMag® kits in 24-well format on KingFisher® Flex platform | 744953 |
| KingFisher® Duo Prime Accessory Kit | Deep-well Plates, Tip Combs and Elution Strips for processing in 96-well format on KingFisher® Duo Prime platform | 744952 |

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 qScript™ is a trademark of Quanta BioSciences Inc.™
 ToughMix® is a registered trademark of Quanta BioSciences Inc.™

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