Bioanalysis

MACHEREY-NAGEL

Nucleic acid purification from clinical samples

For reliable genomic and transcriptomic insights

- Tailored solutions for various clinical sample materials
- Recovery of highly pure nucleic acids for downstream applications such as NGS, qPCR, or ddPCR
- Choose between several formats to optimize your workflow
- Automation-friendly options improve reproducibility

Nucleic acid purification from clinical samples

Challenges of analyzing clinical samples

Reliable clinical sample analysis plays an essential role in human healthcare or disease control and strongly depends on products of high performance and quality. Clinical sample isolation and subsequent processing is demanding on several levels. Probably the most challenging aspect of handling clinical samples is their sheer diversity: blood and various other body fluids, stool samples, and formaldehyde-fixed, paraffin-embedded (FFPE) microscopy slides, all fall under the category of clinical samples. Furthermore, the nucleic acid of interest can originate from both humans as well as various infectious organisms including, but not limited to viruses, bacteria, and protozoans. To complicate matters further, the purpose of isolations can vary from clinical research to diagnostics. It is an ongoing challenge to improve current standards and to cover future clinical requirements.

Why choose MN?

With our expertise in DNA and RNA purification from a wide variety of samples as well as extensive experience in making clinical research products, MACHEREY-NAGEL is the partner of choice for your clinical project. Thanks to painstakingly optimized production and quality control methods, our kits give robust results with a high degree of reliability. With our state of the art facilities and highly skilled research and development scientists, we always strive to remain at forefront of technological development. Furthermore, our experienced technical support scientists are more than happy to assist you with developing your project and integrating our kits into your protocols.

Nucleic acid purification from clinical samples

Kits for nucleic acid purification from clinical samples

Sample Material	Target	Scale	Product	Page
Cell free fluids	RNA	Mini / Midi	NucleoSpin® RNA Virus	4
	RNA / DNA	Mini	NucleoSpin® Virus	4
		8-well strip / 96-well plate	NucleoSpin® 8/96 Virus	5
		Flexible	NucleoMag® Virus	6
Common clinical samples	Viral RNA / DNA, bacterial DNA	Flexible	NucleoMag® Pathogen	7
		Prefilled Plate	NucleoMag® Pathogen Prefilled Plate	8
Blood	DNA	Mini	NucleoSpin® Blood	9
		Midi / Maxi	NucleoSpin® Blood L/XL	9
		8-well strip / 96-well strip plate	NucleoSpin® 8/96 Blood	10
		Mini	NucleoSpin® Blood QuickPure	11
		Flexible	NucleoMag® Blood 200 µL	12
			NucleoMag® Blood 3 mL	12
	RNA	Mini	NucleoSpin® RNA Blood	13
		Midi	NucleoSpin® RNA Blood Midi	13
		8-well strip / 96-well plate	NucleoSpin® 8/96 RNA Blood	14
		Flexible	NucleoMag® RNA Blood	15
Plasma	DNA	Micro	NucleoSpin® cfDNA XS	16
		Midi	NucleoSpin® cfDNA Midi	16
		Snap	NucleoSnap® cfDNA	17
		96-well plate	NucleoSpin® 96 cfDNA	18
		Flexible	NucleoMag® cfDNA	19
	RNA	Mini	NucleoSpin® miRNA Plasma	20
FFPE	DNA	XS	NucleoSpin® DNA FFPE XS	21
		8-well strip / 96-well plate	NucleoSpin® 8/96 DNA FFPE	22
		Flexible	NucleoMag® DNA FFPE	23
	RNA	XS	NucleoSpin® totalRNA FFPE XS	24
		Mini	NucleoSpin® totalRNA FFPE	24
Stool	DNA	Mini	NucleoSpin® DNA Stool	25
		96-well plate	NucleoSpin® 96 DNA Stool	26
	RNA	Mini	NucleoSpin® RNA Stool	27
Swab	DNA	Flexible	NucleoMag® DNA Swab	28
IVD*	DNA	Mini	NucleoSpin® Dx Blood	29
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	RNA / DNA	Mini	NucleoSpin® Dx Virus	31
	Viral RNA	Flexible	NucleoMag® Dx Pathogen	32

* in accordence with the EU IVDR regulation 2017/746, not available in the USA and other countries, please inquire.

Purification technologies

	NucleoSpin®	NucleoSpin® 8	NucleoSpin® 96	NucleoSnap®	NucleoMag®
Technology	Silica membrane	Silica membrane	Silica membrane	Precipitation and filtration	Magnetic bead
Format	XS, Mini, Midi, Maxi	8-well	96-well	Midi snap off column	Flexible
Processing	Vacuum / centrifugation	Vacuum / centrifugation	Vacuum / centrifugation	Vacuum (centrifugation for elution)	Magnet

Icon annotation

XS — Mini spin column for microcentrifuge tubes (1.5 mL or 2 mL). A funnel shaped thrust ring is holding a silica membrane of 2.0 mm diameter for xtra small elution volumes

Mini — Mini spin column for microcentrifuge tubes (1.5 mL or 2 mL)

Midi — Midi column for gravity-flow (NucleoBond® Xtra / NucleoBond® PC technology) or 15 mL midi spin columns for centrifuges

Maxi — NucleoBond® Xtra Maxi / NucleoBond® AX 500 Column for gravity flow or 50 mL NucleoSpin® Maxi Column for centrifuges

Mag — Superparamagnetic beads

Snap — Disposable funnel container combined with a mini spin column for vacuum processing (e.g., using NucleoVac 24 Vacuum Manifold), and subsequent centrifugation for elution in a microcentrifuge tubes (1.5 mL or 2 mL)

8-well — Mini spin columns in 8-well strip format

96-well — Mini spin columns in 96-well plate format

Nucleic acid purification from cell-free fluids

NucleoSpin® Virus · NucleoSpin® RNA Virus

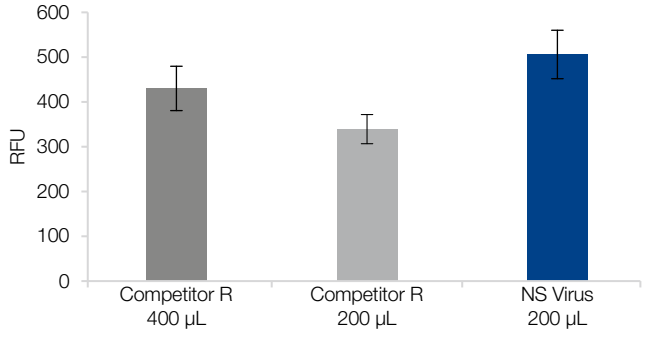
Reliable viral RNA and DNA purification

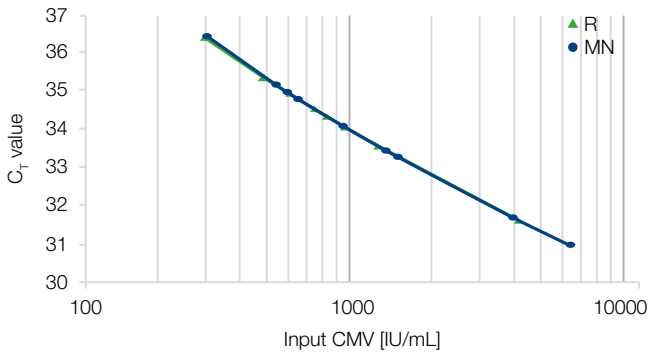
- Convenient and highly efficient lysis of viruses
- Superior yields from smaller sample sizes
- High sensitivity for DNA and RNA viruses e.g., HIV, HPV, H5N1, HCV, HBV, CMV

Products at a glance

	Mini NucleoSpin® Virus	Mini NucleoSpin® RNA Virus
Technology	Silica membrane technology	Silica membrane technology
Sample material	Cell-free biological fluids, plasma, serum	Cell-free biological fluids, plasma, serum
Fragment size	100 bp–approx. 50 kbp	100 bp–approx. 50 kbp
Elution volume	30 µL	50 µL
Typical yield	Depends on sample amount and quality	Depends on sample amount and quality
Binding capacity	25 µg	40 µg
Preparation time	50 min/6 preps	30 min/4–6 preps

Application data





Superior yields from smaller sample sizes

NucleoSpin® Virus kit shows higher yields compared to competitor R , when it comes to extracting enteroviral RNA from plasma. The yield remains higher even when double the amount of plasma is processed with the competitor kit.

Reliable viral CMV DNA recovery over a range of virus titres

NucleoSpin® Virus reliably isolates CMV DNA from different plasma samples. The CT value correlates linearly with diverse virus titers, showing high, consistent efficiency. Quantified by qPCR in Roche LightCycler® 480.

Data kindly provided by Dr. Tiemann, Dipl. Biol. Hartmann, LABCON-OWL GmbH, Germany

References

Guinoiseau, T. et al. Deep sequencing is an appropriate tool for the selection of unique Hepatitis C virus (HCV) variants after single genomic amplification. *PLoS ONE 2017*

Wu, Y. et al.. Evaluation of the cross-protective effect of VR2332 modified live virus vaccine against a recombinant NADC34-like porcine reproductive and respiratory syndrome virus. *Frontiers in Veterinary Science 2024*

Ordering information

Product	Preps	REF
NucleoSpin® Virus	10 / 50 / 250	740983.10 / .50 / .250
NucleoSpin® RNA Virus	10 / 50 / 250	740956.10 / .50 / .250
NucleoSpin® RNA Virus, Midi Kit	25	740958

Nucleic acid purification from cell-free fluids

NucleoSpin® 8/96 Virus

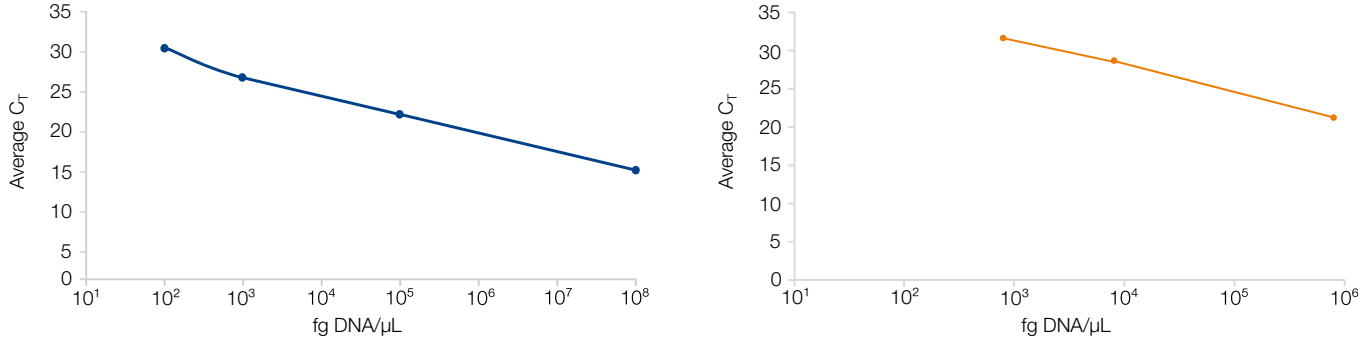
Silica membrane based isolation of viral RNA/DNA from cell-free biological fluids

- Complete processing at room temperature
- Optimal recovery of RNA and DNA for sensitive virus detection

Products at a glance

	8-well NucleoSpin® 8 Virus	96-well NucleoSpin® 96 Virus
Technology	Silica membrane technology	Silica membrane technology
Sample material	< 150 µL biological fluids (e.g., serum, plasma, saliva, urine)	< 150 µL biological fluids (e.g., serum, plasma, saliva, urine)
Fragment size	100 bp–approx. 50 kbp	100 bp–approx. 50 kbp
Elution volume	70–100 µL	70–100 µL
Typical yield	Depends on sample type, amount and quality	Depends on sample type, amount and quality
Preparation time	60 min/6 strips	60 min/ plate

Application data



Proportional detectability of viral DNA/RNA even at low titers

Nucleic acids were extracted from dilution series of DNA (blue) and RNA viruses (orange) and quantified by qPCR. Yields have been shown to change in proportion to the virus dilution down to 100 viral particles per µL and 800 particles per µL respectively.

References

Gallian, P. et al. Epidemiology of chikungunya virus outbreaks in Guadeloupe and Martinique, 2014: An observational study in volunteer blood donors. *PLoS Neglected Tropical Diseases 2017*

Batéjat, C.. et al. Heat inactivation of monkeypox virus. *Journal of Biosafety and Biosecurity 2022*

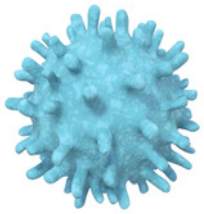
Ordering information

Product	Preps	REF
NucleoSpin® 8 Virus	12 x 8 / 60 x 8	740643 / .5
NucleoSpin® 8 Virus Core Kit*	48 x 8	740451.4
NucleoSpin® 96 Virus	2 x 96 / 4 x 96	740691.2 / .4
NucleoSpin® Virus Core Kit*	4 x 96	740452.4
Related product		
Liquid Proteinase K	5 mL	740396

* Kits with basic content focusing on automation plattforms. Additional accessories can be combined as needed.

Nucleic acid purification from cell-free fluids

NucleoMag® Virus



Magnetic bead based isolation of viral RNA and DNA from cell-free biological fluids

- Elution in minimal volume to achieve the highest sensitivities for virus detection

Product at a glance

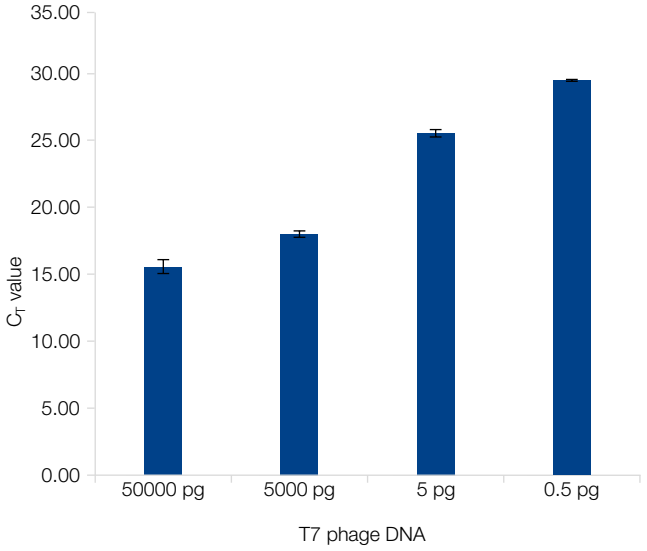
	NucleoMag® Virus
Technology	Magnetic bead technology
Sample material	< 200 µL serum, plasma, cell-free biological fluid
Fragment size	100 bp – 50 kbp
Typical yields	Depending on sample amount and quality
Elution volume	50 – 100 µL
Preparation time	40 – 120 min/96 preps

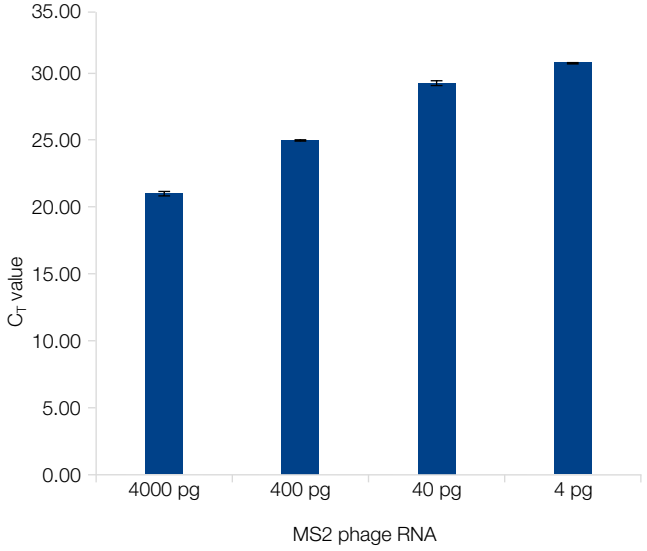
Reference

Lupi, D. et al. Combined Effects of pesticides and Electromagnetic-Fields on Honeybees: Multi-Stress exposure. *Insects 2021*

Hongjaisee, S. et al. Comparison of simple RNA extraction methods for molecular diagnosis of hepatitis C virus in plasma. *bioRxiv (Cold Spring Harbor Laboratory) 2022*

Application data





Highly efficient, automated purification of viral DNA from human plasma

T7 phage DNA was spiked into human plasma samples. Viral DNA was purified in an automated manner by using the NucleoMag® Virus kit on the epMotion 5073m workstation. The recovery efficiency was determined by a subsequent Taqman® Probe qPCR assay using the Applied Biosystems® 7500 Real-Time PCR System.

Highly efficient, automated purification of viral RNA from human plasma

MS2 phage RNA was spiked into human plasma samples. Viral RNA was purified in an automated manner by using the NucleoMag® Virus kit on the epMotion 5073m workstation. The recovery efficiency was determined by a subsequent Taqman® Probe qRT-PCR assay using the Applied Biosystems® 7500 Real-Time PCR System.

Ordering information

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

Nucleic acid purification from common clinical samples

NucleoMag® Pathogen

Magnetic bead based isolation of viral RNA / DNA and bacterial DNA

- One kit for all common clinical samples
- Reliable nucleic acid isolation – suitable even for low viral titers

Product at a glance

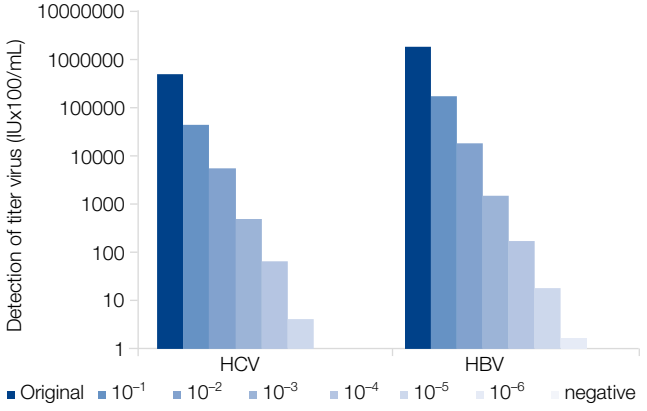
	Mag NucleoMag® Pathogen
Technology	Magnetic bead technology
Sample material	< 200 µL whole blood, serum, plasma, swab wash solutions, feces < 25 mg tissue
Fragment size	300 bp – 50 kbp
Typical yield	Depending on sample amount and quality
Elution volume	50 – 100 µL
Preparation time	40 – 120 min/96 preps (excluding lysis)

References

"The NucleoMag® Pathogen kit meets all expectations and requirements of a nucleic acid extraction system for the molecular diagnostic market."

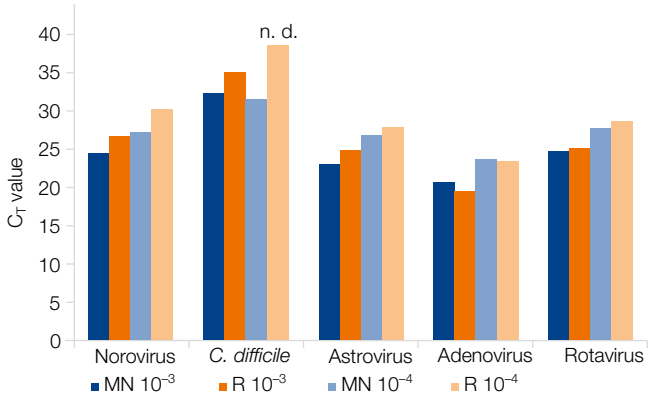
Dr. Carsten Tiemann, LABCON-OWL GmbH (certified laboratory)

Application data



Highly sensitive detection of Hepatitis B (HBV) and Hepatitis C (HCV) virus from human plasma

Triplicates of human plasma dilutions (200 µL, with original virus titer as shown) were subjected to the NucleoMag® Pathogen extraction procedure. Eluates were used as input for the RealStar® HBV PCR 1.0 and the RealStar® HCV RT-PCR 1.0 assays (altona diagnostics). The purified nucleic acids enabled highly sensitive detection of Hepatitis B (HBV) and Hepatitis C (HCV) viruses in human plasma samples. PCR inhibition was not observed.



Competitive, highly sensitive detection of pathogens from human fecal samples

Triplicates of human fecal sample dilutions ($10^{-3-1}0-4$) were subjected to the NucleoMag® Pathogen extraction procedure and to a competitor extraction procedure (R). Eluates were used as input for PCR analysis performed using the RIDA® GENE Viral Stool Panel I (R-Biopharm) and RealStar® Clostridium difficile PCR Kit 1.0 (altona diagnostics). The NucleoMag® Pathogen kit shows a comparable or even superior performance in comparison to the competitor kit.

Ordering information

Product	Preps	REF
NucleoMag® Pathogen	1x 96 / 4 x 96	744210.1 / .4

Nucleic acid purification from common clinical samples

NucleoMag® Pathogen Prefilled Plates

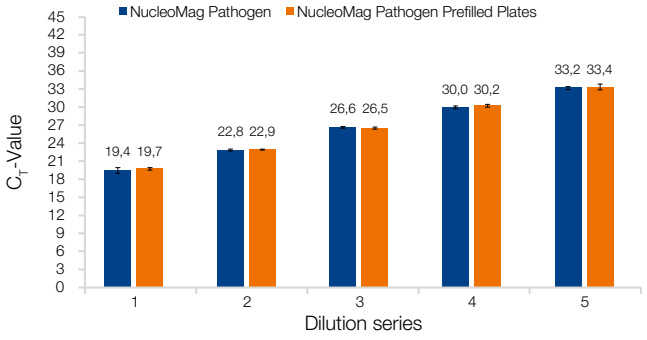
Buffer chemistry of NucleoMag® Pathogen kit prefilled in convenient 96-well plates

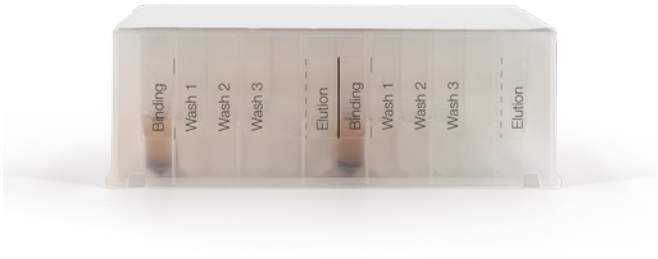
- Ideal for isolation of viral DNA / RNA and bacterial DNA from clinical samples
- Compatible with the MagnetaPure® 32, IsoPure Mini™ Plus and other specific magnetic rod systems

Product at a glance

	Mag NucleoMag® Pathogen Prefilled Plates
Technology	Magnetic bead technology
Sample material	Whole blood, human tissue, plasma, serum, stool, swabs, cell-free biological fluids
Fragment size	300 bp to approx. 50 kbp
Typical yields	Depending on the sample type and amount
Elution volume	100 µL
Preparation Time	Approx. 30 minutes (excluding lysis)

Application data





High extraction performance of NucleoMag® Pathogen Prefilled Plates

Human saliva was used for the isolation of bluetongue virus (BTV) in several dilutions with the NucleoMag® Pathogen kit and the new NucleoMag® Pathogen Prefilled Plates. Five different dilution series of BTV (dsRNA) were used for extractions on the MagnetaPure® 32 Plus extraction robot. Results show qPCR-data with comparable CT-values showing a very consistent and reliable virus detection for both prefilled and freshly prepared plates.

Ordering information

Product	Preps	REF
NucleoMag® Pathogen Prefilled Plates	1 x 96	744211

Nucleic acid purification from blood

NucleoSpin® Blood

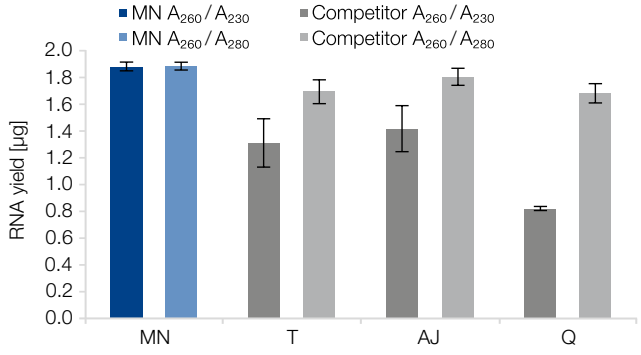
For rapid purification of high quality DNA from Blood

- All purpose effectiveness compatible with all blood stabilization substances (e.g., citrate, EDTA, heparin, CPDA)
- Pathogen detection by isolation of viral DNA or bacterial DNA from blood samples

Product at a glance

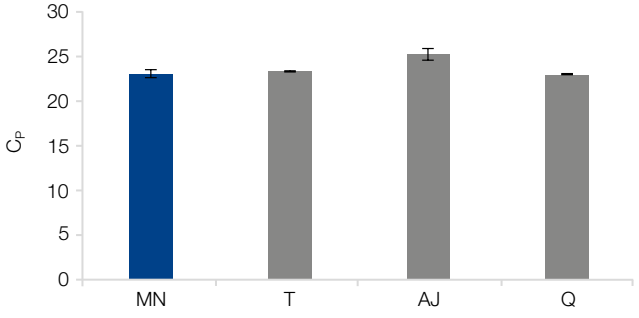
	Mini NucleoSpin® Blood	Midi NucleoSpin® Blood L	Maxi NucleoSpin® Blood XL
Technology	Silica membrane technology	Silica membrane technology	Silica membrane technology
Sample material	Blood (5 – 200 µL), human / animal cells (< 5 x 10^6)	Blood (0.2 – 2 mL), human / animal cells (2 x 10^7)	Blood (2 – 10 mL), human / animal cells (10^8)
Fragment size	200 bp – approx. 50 kbp	200 bp–approx. 50 kbp	200 bp – approx. 50 kbp
Typical yield	4 – 6 µg (200 µL blood)	40 – 60 µg (2 mL blood)	200 – 300 µg (10 mL blood)
Elution volume	60 – 200 µL	120 – 200 µL	600 – 2000 µL
Binding capacity	60 µg	250 µg	700 µg
Preparation time	30 min/prep	60 min/prep	60 min/prep

Application data



Superior purification with the NucleoSpin® Blood kit

DNA was isolated from human blood samples (n = 3) using the NucleoSpin® Blood kit and competitor kits from T, Q and AJ (light grey bars for A_{260}/A_{280} and dark grey bars for A_{260}/A_{230}). The purity was determined by UV-spectrometry resulting in an average A_{260}/A_{280} value for the NucleoSpin® Blood kit of 1.89 ± 0.03 (dark blue bar) and an average A_{260}/A_{230} value (light blue bar) of 1.88 ± 0.03.



Competitive sensitivity measured by qPCR

DNA was extracted from human blood samples the with NucleoSpin® Blood kit (dark blue bar) and the competitor kits from T, Q and AJ (grey bars). Samples were analyzed in triplicate by qPCR for β-globin (268 bp). With an average amplification cycle of 23.1 the results demonstrate the competitive performance and reliably high quality of DNA extraction with the NucleoSpin® Blood kit.

References

Simeonov, D. R. et al. A. Discovery of stimulation-responsive immune enhancers with CRISPR activation. *Nature 2017*

Peifer, M. et al. Telomerase activation by genomic rearrangements in high-risk neuroblastoma. *Nature 2015*

Ordering information

Product	Preps	REF
NucleoSpin® Blood	10 / 50 / 250	740951.10 / .50 / .250
NucleoSpin® Blood L	20	740954.20
NucleoSpin® Blood XL	10 / 50	740950.10 / .50

Nucleic acid purification from blood

NucleoSpin® 8/96 Blood

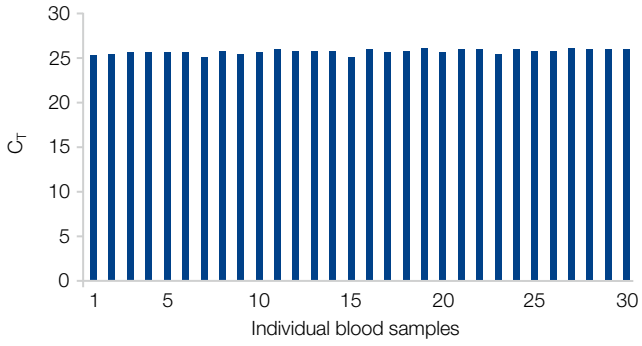
Medium and high throughput kits for DNA isolation from blood

- Compatible with common blood collection tubes and anticoagulants (EDTA, citrate, CPDA, and heparin)
- Improved flow rates minimize risk of clogging when processing under vacuum or positive pressure

Product at a glance

	8-well NucleoSpin® 8 Blood	96-well NucleoSpin® 96 Blood
Technology	Silica membrane technology	Silica membrane technology
Sample material	Blood (< 200 µL), human / animal cells (2 x 106)	Blood (< 200 µL), human / animal cells (2 x 106)
Fragment size	300 bp-approx. 50 kbp	300 bp–approx. 50 kbp
Typical yields	4 – 6 µg	4 – 6 µg
Elution volume	100 µL	100 µL
Binding capacity	20 µg	20 µg
Preparation time	35 min/6 strips	70 min/plate

Application data



Highly uniform yields ensure a reliable prep

DNA was extracted from 30 different blood samples and analyzed by qPCR for β-actin. With an average amplification cycle of 25.7 and a standard deviation of only 0.29 C_T, the results demonstrate the reliably high quality of DNA extraction with NucleoSpin® 96 Blood.

References

Prechl, J. et al., Serological and genetic evidence for altered complement system functionality in systemic lupus erythematosus: findings of the GAPAID Consortium. *PLoS ONE 2016*

Secq, V. et al., Triple negative breast carcinoma EGFR amplification is not associatedwith EGFR, Kras or ALK mutations. *British Journal of Cancer 2014*

Ordering information

Product	Preps	REF
NucleoSpin® 8 Blood	12 x 8 / 60 x 8	740664 / .5
NucleoSpin® 8 Blood Core Kit*	48 x 8	740455.4
NucleoSpin® 96 Blood	1 x 96 / 4 x 96	740665.1 / .4
NucleoSpin® 96 Blood Core Kit*	4 x 96	740456.4

* Kits with basic content focusing on automation platforms. Additional accessories can be combined as needed.

Nucleic acid purification from blood

NucleoSpin® Blood QuickPure

Rapid isolation of genomic DNA from whole blood and blood components

- Washing and drying is combined in one step for reduced hands-on-time
- Highly concentrated and consistent DNA yields for sensitive downstream applications

Product at a glance

	Mini NucleoSpin® Blood QuickPure	
Technology	Silica membrane technology	
Sample material	5 – 200 µL whole blood (human or animal, fresh, frozen or stabilized) Buffy coat Platelets	Body fluids Serum Plasma < 5 x 10^6 cultured cells
Fragment size	200 bp – 50 kbp	
Typical yields	4 – 6 µg	
Elution volume	30 – 50 µL	
Preparation time	25 min/prep	

References

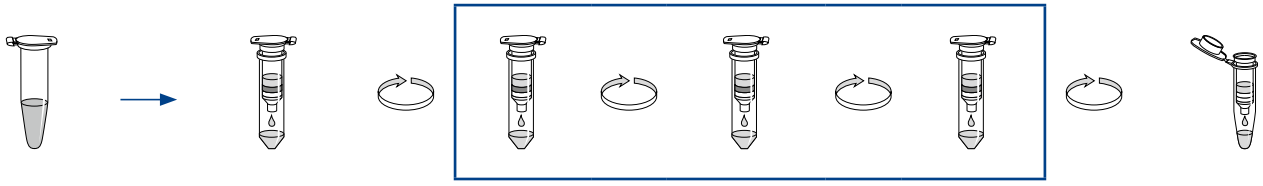
Yunga, S., et al. Timing of the human prenatal antibody response to Plasmodium falciparum antigens. *PLoS ONE 2017*

Sun, Y., et al. A Common Variant Of Ubiquinol-Cytochrome c Reductase Complex Is Associated with DDH. *PLoS ONE 2015*

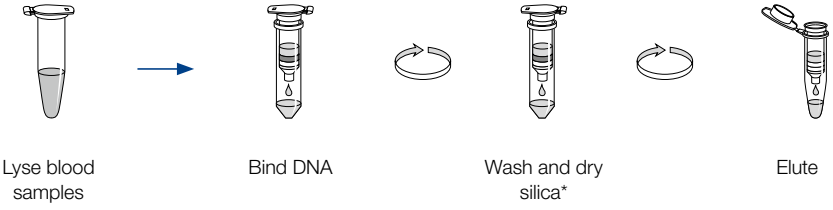
Procedure

NucleoSpin® Blood QuickPure combines three steps of the NucleoSpin® Blood kit in one!

NucleoSpin® Blood



NucleoSpin® Blood QuickPure



Ordering information

Product	Preps	REF
NucleoSpin® Blood QuickPure	10 / 50 / 250	740569.10 / .50 / .250
NucleoSpin® 8 Blood QuickPure	12 x 8 / 60 x 8	740666 / .5
NucleoSpin® 96 Blood QuickPure	1 x 96 / 4 x 96 / 24 x 96	740667.1 / .4 / .24

Nucleic acid purification from blood

NucleoMag® Blood 200 µL · 3 mL

Small to large scale isolation of DNA from whole blood

- Complete processing at room temperature facilitates automation
- Small elution volumes for highly concentrated DNA

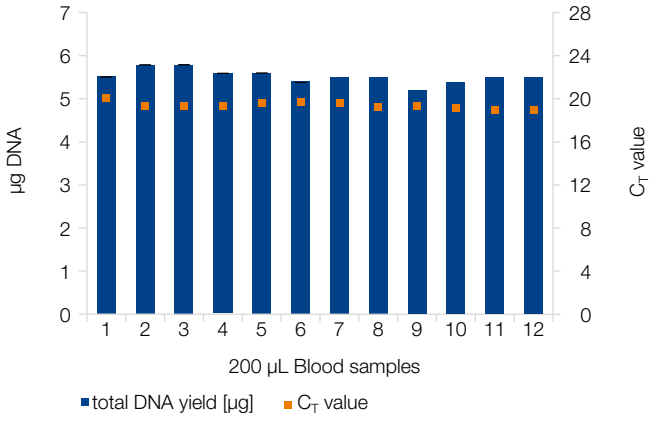
Product at a glance

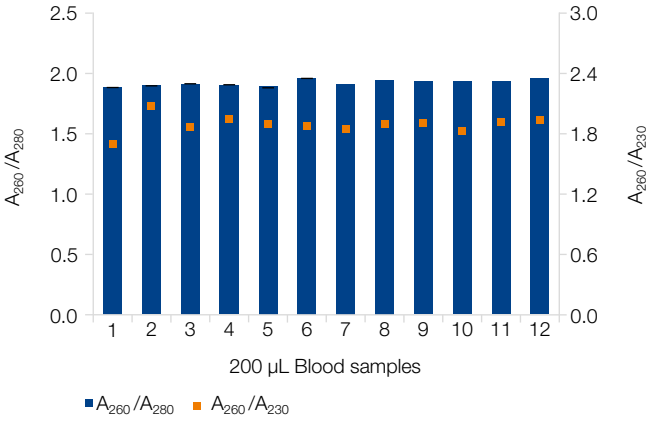
	Mag NucleoMag® Blood 200 µL	Mag NucleoMag® Blood 3 mL
Technology	Magnetic bead technology	Magnetic bead technology
Sample material	< 200 µL blood (fresh, frozen, EDTA or citrate)	< 3 mL blood (fresh, frozen, EDTA or citrate)
Fragment size	300 bp – 50 kbp	300 bp – 50 kbp
Typical yields	2 – 8 µg (200 µL)	100 – 130 µg (3 mL)
Elution volume	50 – 100 µL	1000 µL
Preparation time	40 – 120 min/96 preps (excluding lysis)	60 min/24 preps (excluding lysis)

Reference

Wiers, C. E. et al. Effects of depressive symptoms and peripheral DAT methylation on neural reactivity to alcohol cues in alcoholism. *Translational Psychiatry 2015*

Application data





Robust yields and excellent performance in downstream applications

DNA was isolated from fresh 200 µL human blood samples (n= 12) using the NucleoMag® Blood 200 µL kit on an ep*Motion*® 5073m workstation. The DNA concentration of all 12 samples was determined by UV spectroscopy, dark blue bars). Performance in downstream applications was evaluated by conducting qPCR for a 250 bp sequence in the ß-actin gene. The target sequence was successfully amplified in all samples (orange squares = C_T values).

Highly pure nucleic acids from human blood samples

DNA was isolated from fresh 200 µL human blood samples (n= 12) using the NucleoMag® Blood 200 µL kit on a ep*Motion*® 5073m workstation. The purity was determined by UV spectroscopy. DNA quality analysis resulted in an average A260/A280 value of 1.92 +/- 0.02 and in an average A260/A230 value of 1.86 +/- 0.06.

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

Nucleic acid purification from blood

NucleoSpin® RNA Blood · NucleoSpin® RNA Blood Midi

Mini and Midi spin kit for RNA isolation from fresh and frozen whole blood

- Direct total blood lysis enables a very simple and convenient handling at room temperature
- Compatible with common blood collection tubes and anticoagulants, e.g., EDTA, citrate, and heparin

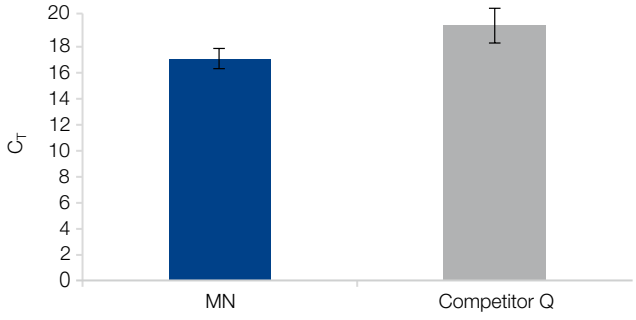
Patented technology

Product at a glance

	Mini NucleoSpin® RNA Blood	Midi NucleoSpin® RNA Blood Midi
Technology	Silica membrane technology	Silica membrane technology
Sample material	< 400 µL blood	400 – 1300 µL
Fragment size	≥ 200 nt	≥ 200 nt
Typical yield	1 – 8 µg* (400 µL blood)	4 – 26 µg* (1300 µL blood)
Elution volume	40 – 120 µL	200 – 400 µL
Binding capacity	200 µg	700 µg
Preparation time	55 min/6 preps	75 min/6 preps

* RNA yield strongly depends on the leukocyte number in each individual blood sample.

Application data



Direct lysis results in higher yields compared to selective erythrocyte lysis

RNA was isolated from from six different donors with the NucleoSpin® RNA Blood kit and a kit from competitor Q (based on selective erythrocyte lysis). For all samples, C_T values are lower for NucleoSpin® RNA Blood indicating a higher RNA yield.

References

Dreymueller et al. 2016 “The perioperative time course and clinical significance of the chemokine CXCL16 in patients undergoing cardiac surgery.” *Journal of Medical and Molecular Medicine*

Brett at al. 2014 “Massively parallel sequencing of patients with intellectual disability, congenital anomalies and/or autism spectrum disorders with a targeted gene panel.” *PLOS ONE*

Ordering information

Product	Preps	REF
NucleoSpin® RNA Blood	10 / 50	740200.10 / .50
NucleoSpin® RNA Blood Midi	20	740210.20

Nucleic acid purification from blood

NucleoSpin® 8/96 RNA Blood

Medium and high throughput kits for RNA isolation from blood

- Direct blood lysis by patented lysis buffer – no selective erythrocyte lysis required
- Compatible with common blood collection tubes and anticoagulants (EDTA, citrate, and heparin)

Patented technology

Product at a glance

	NucleoSpin® 8 RNA Blood (8-well)	NucleoSpin® 96 RNA Blood (96-well)
Technology	Silica membrane technology	Silica membrane technology
Sample material	< 400 µL whole blood (fresh or frozen)	< 400 µL whole blood (fresh or frozen)
Fragment size	≥ 200 nt	> 200 nt
Typical yield	1 – 8 µg* (400 µL whole blood)	1 – 8 µg (400 µL whole blood)
Elution volume	50 – 130 µL	50 – 130 µL
Theoretical binding capacity	100 µg	100 µg
Preparation time	60 min/6 strips	100 min/plate

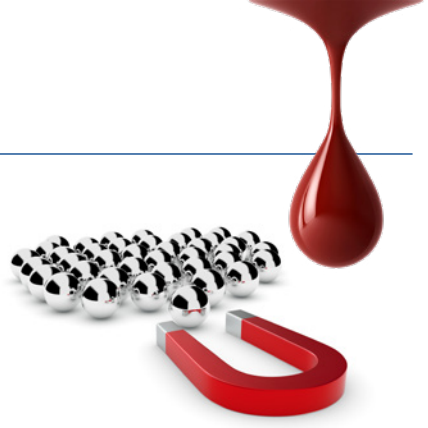
References

Jégou, M. et al., Whole blood transcriptomics is relevant to identify molecular changes in response to genetic selection for feed efficiency and nutritional status in the pig. *PLoS ONE 2016*

Ordering information

Product	Preps	REF
NucleoSpin® 8 RNA Blood	12 x 8 / 60 x 8	740220 / .5
NucleoSpin® 96 RNA Blood	2 x 96 / 4 x 96	740225.2 / .4

Nucleic acid purification from blood



NucleoMag® RNA Blood

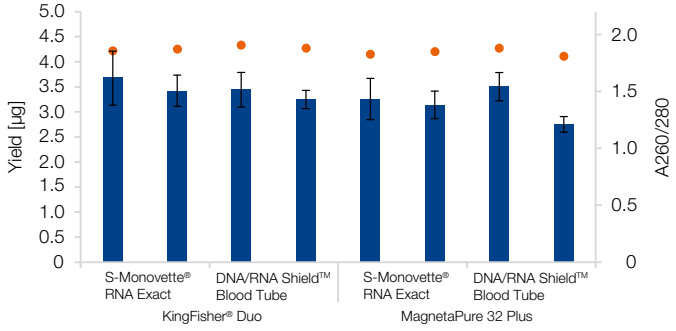
Isolation of RNA from blood samples

- Compatible with various blood storage tubes: SARSTEDT S-Monovette® RNA Exact, Zymo DNA/RNA ShieldTM, TempusTM RNA Blood Tubes & EDTA/Citrate Blood
- RNA-stabilizing buffer chemistry allows for processing at room temperature

Product at a glance

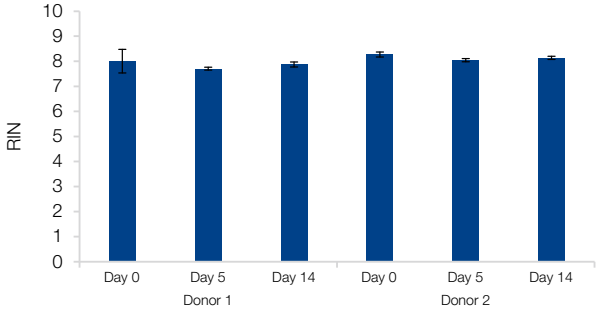
	Mag NucleoMag® RNA Blood
Technology	Magnetic bead technology
Sample material	Whole blood preserved with: ▪ SARSTEDT S-MONOVETTE® RNA Exact ▪ Zymo DNA/RNA Shield ▪ Tempus RNA Blood Tubes ▪ EDTA/Citrate Blood
Fragment size	> 200 nt
Typical yields	3 µg to 4 µg, depending on donor and sample quality
Elution volume	50 µL to 100 µL
Preparation Time	Approx. 90 min automated, 120 min manually (excluding lysis)

Application data



Comparative analysis of RNA yield and purity from SARSTEDT S-Monovette® RNA Exact and Zymo DNA/RNA ShieldTM Blood Tubes

Blood specimens sourced from two distinct donors were collected using SARSTEDT S-Monovette® RNA Exact or Zymo DNA/RNA ShieldTM Blood Tubes, followed by purification employing the NucleoMag® RNA Blood Kit via automated protocols on the MagnetaPure 32 Plus or KingFisher Duo platform (n = 3 per tube and instrument). Purified RNA underwent UV spectrometry analysis to assess total yield (blue bars) and purity (A260/280, orange dots). The data underscore remarkable reproducibility in RNA yield and purity across different donors, blood collection tubes, and automation platforms.



Robust RNA integrity profiles with S-Monovette® RNA Exact collected samples

Blood specimens were procured from two distinct donors utilizing SARSTEDT S-Monovette® RNA Exact tubes and were subjected to purification employing the NucleoMag® RNA Blood kit via the automated MagnetaPure 32 Plus magnetic rod platform. Processing occurred subsequent to storage at room temperature for 2 hours (Day 0), 5 days (Day 5), or after two weeks of refrigeration at 2 – 8 °C (Day 14). Analysis conducted utilizing the Agilent Pico-Chip revealed excellent RNA integrity (8.0 ± 0.19), persisting across all examined time points and donors (n= 3 per donor and time point).

Ordering information

Product	Preps	REF
NucleoMag® RNA Blood	1 x 96 / 4 x 96	744352.1 / .4

Nucleic acid purification from plasma

NucleoSpin® cfDNA XS · cfDNA Midi

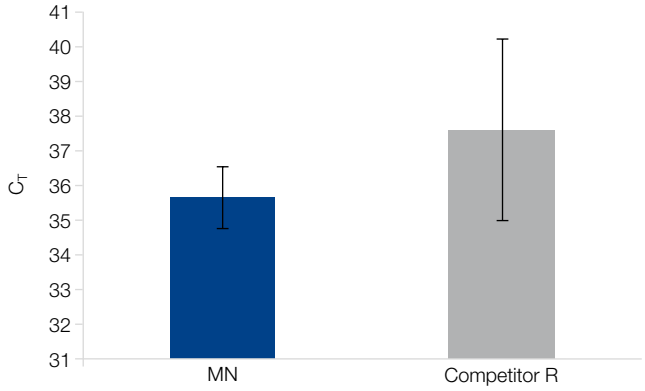
Efficient isolation of cell-free DNA in a single spin format

- High recovery of fragmented DNA > 50 bp
- No need for carrier RNA

Product at a glance

	XS NucleoSpin® cfDNA XS	Midi NucleoSpin® cfDNA Midi
Technology	Silica membrane technology	Silica membrane technology
Sample material	Plasma / serum (< 240 µL)	Plasma (1 – 5 mL)
Fragment size	≥ 50 bp	≥ 50 bp
Typical yield	25 pg – 25 ng (240 µL plasma)	Depending on sample source, storage, and quality
Elution volume	5 – 30 µL	200 µL (140 µL final eluate volume)
Preparation time	20 min/6 preps (rapid procedure)	90 min/24 preps (EDTA plasma)

Application data



Significantly better performance with greater consistency

The significantly better performance of NucleoSpin® Plasma XS is demonstrated by an average 2.1 C_T shorter amplification time in qPCR (primer for Amelogenin) with a smaller variance.

References

Ma et al. Cell-Free DNA Provides a Good Representation of the Tumor Genome Despite Its Biased Fragmentation Patterns.

Yi et al. Increased plasma cell-free DNA level during HTNV infection: correlation with disease severity and virus load.

Viruses 2014

Ordering information

Product	Preps	REF
NucleoSpin® cfDNA XS	10 / 50 / 250	740900.10 / .50 / .250
NucleoSpin® cfDNA Midi	48	740303.48
NucleoSpin® cfDNA Midi Core Kit	48	740302.48

Nucleic acid purification from plasma

NucleoSnap® cfDNA

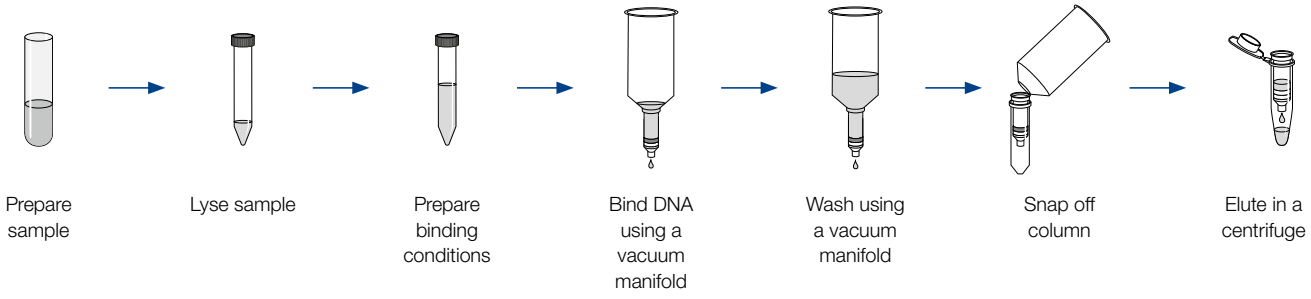
Isolation of cell-free DNA from large volumes of blood plasma or urine

- Snap off column for quick vacuum processing of large sample volumes up to 10 mL
- Optimized protocol for Cell-free DNA BCT® (Streck)

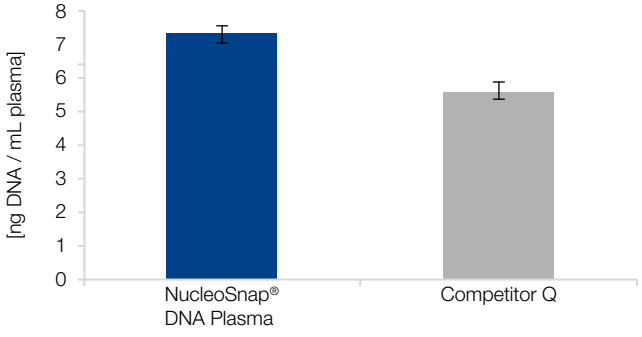
Product at a glance

	Snap NucleoSnap® cfDNA
Technology	Precipitation and filtration
Sample material	Plasma (EDTA / BCT Streck) / urine (1 – 10* mL)
Fragment size	> 50 bp
Typical yield	Depending on sample source, storage, and quality
Elution volume	20 – 100 µL
Preparation time	45 min/6 preps (EDTA plasma)

* For processing volumes larger than 5 mL, additional lysis buffer and Proteinase K have to be ordered separately. Please refer to the corresponding user manual.



Application data



Efficient isolation of cfDNA from 5 mL human EDTA plasma

Isolation of cfDNA from EDTA plasma with the NucleoSnap® DNA Plasma kit and vacuum-based kit from a competitor (competitor Q). DNA yields were quantified by qPCR (Quantifiler® Human DNA Quantification Kit on a Applied Biosystems 7500 Real-Time PCR System).

Ordering information

Product	Preps	REF
NucleoSnap® DNA Plasma	10 / 50	740300.10 / .50

Nucleic acid purification from plasma

NucleoSpin® 96 cfDNA

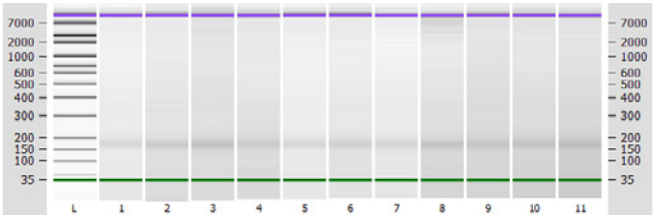
High-throughput cfDNA isolation in a 96-well format

- Purification of cfDNA down to 50 bp

Product at a glance

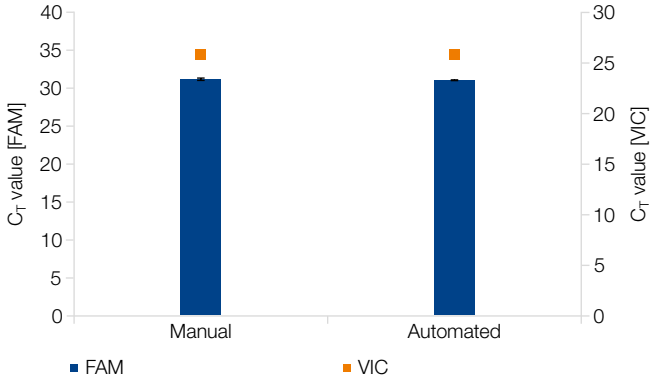
	96-well NucleoSpin® 96 cfDNA
Technology	Silica membrane technology
Sample material	0.5 – 2 mL plasma
Fragment size	> 50 bp
Typical yields	Depending on sample source, storage and quality
Elution volume	100 µL
Preparation time	90 min/plate (excluding lysis)

Application data



Consistent cfDNA recovery

The isolation of cfDNA from 1 mL human EDTA plasma using the NucleoSpin® 96 cfDNA kit on the ep*Motion*® 5075vt platform shows the characteristic peak at approx. 170 bp after measurement by capillary gel electrophoresis using the Agilent Bioanalyzer™ 2100 system with the High Sensitivity DNA kit.



Proven automation concept without performance losses

DNA was isolated from human plasma (n= 8; 1 mL each) using the NucleoSpin® 96 cfDNA kit automated on the ep*Motion*® 5075vt platform or via manual purification using the NucleoVac 96 Vacuum Manifold (MN). The final cfDNA recovery was determined by quantitative real time PCR, using the Quantifiler® Human DNA Quantification kit. The TaqMan® probe for detecting the target region (human telomerase reverse transcriptase gene) of interest is labeled with a FAM™ reporter dye (blue bars). VIC® dye was used for detecting the amplified Internal PCR control DNA (orange squares), enabling verification that the polymerase, the assay, and the detection instrumentation are working correctly.

Ordering information

Product	Preps	REF
NucleoSpin® 96 cfDNA	1 x 96 / 4 x 96	740873.1 / .4
NucleoSpin® 96 cfDNA Core Kit*	1 x 96 / 4 x 96	740874.1 / .4

* Kits with basic content focused on automation platforms. Additional accessories can be combines as needed.

Nucleic acid purification from plasma

NucleoMag® cfDNA

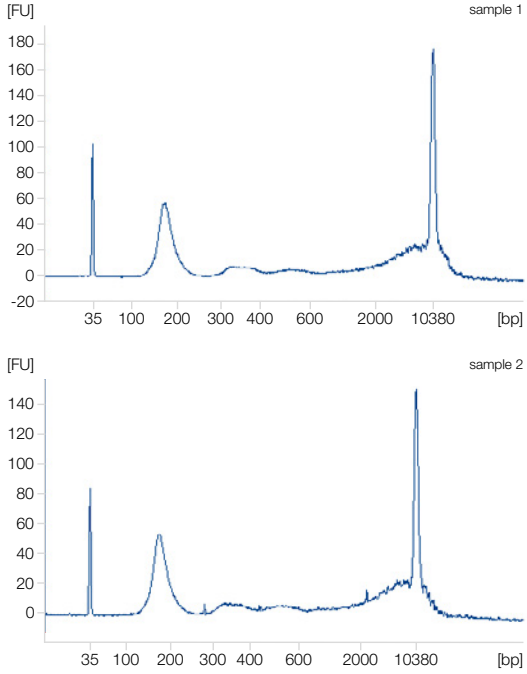
Isolation of cell-free DNA from flexible sample volumes

- Consistent cfDNA recovery from 1 – 10 mL plasma samples
- Efficient purification of fragmented DNA as small as 50 bp

Product at a glance

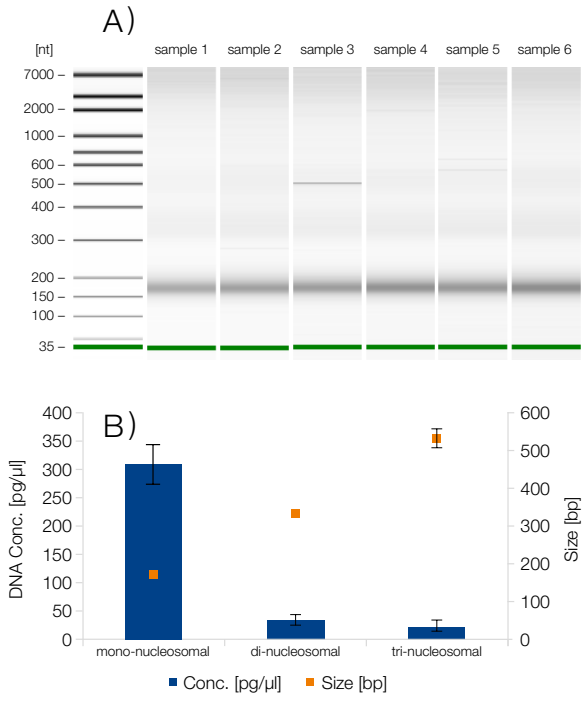
	Mag NucleoMag® cfDNA
Technology	Magnetic bead technology
Sample material	1 – 10 mL human plasma (EDTA, cell-free DNA BCT)
Fragment size	≥ 50 bp
Typical yields	Depending on sample source, storage and quality
Elution volume	50 – 200 µL
Preparation Time	60 min/ 24 preps (excluding lysis)

Application data



Competitive cfDNA recovery from challenging samples

Total cfDNA was purified from 2 mL human EDTA plasma derived from different donor samples using the NucleoMag® dfDNA kit on the Hamilton NIMBUS Presto System. The efficient purification is demonstrated by the characteristic peak at approximately 150 bp to 170 bp, determined using the Bioanalyzer™ 2100 system and the High Sensitivity DNA kit from Agilent. First and last peaks correspond to the internal markers that were run with each of the samples.



Consistent cfDNA recovery, regardless of plasma sample

A) The isolation of cfDNA from human EDTA plasma using the NucleoMag® cfDNA kit shows clear bands at the expected size of approx. 170 bp in the virtual gel image using the Agilent Bioanalyzer™ 2100 system with the High Sensitivity DNA kit.

B) Concentration of the respective nucleosomal units of the above-mentioned samples were determined by integrating the peak areas from the bioanalyzer analysis. The fragment length distributions of mono-nucleosomal, di-nucleosomal and tri-nucleosomal DNA fractions were analyzed and indicate the typical gradual decrease in concentration with increasing nucleosome number.

Ordering infromation

Product	Preps	REF
NucleoMag® cfDNA	1 x 96 / 4 x 96	744550.1 / .4

Nucleic acid purification from plasma

NucleoSpin® miRNA Plasma

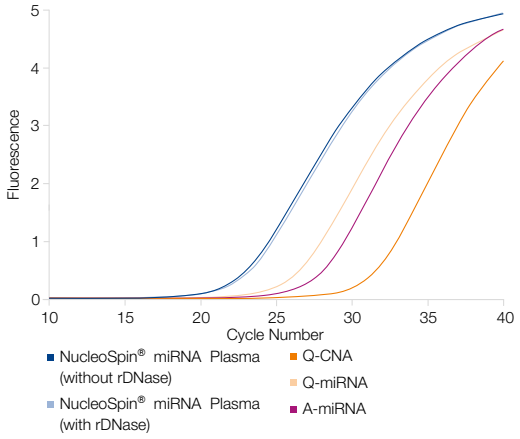
Mini spin kit for isolation of small RNA and DNA from plasma, serum, and exosomes

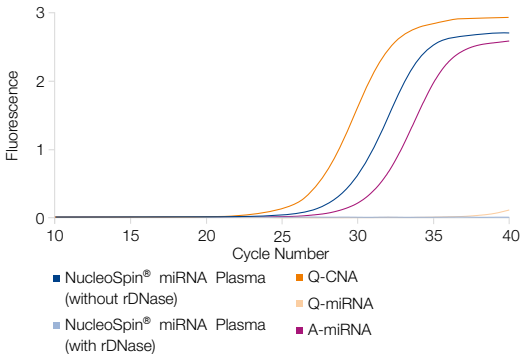
- Simple and fast procedure – no phenol / chloroform extraction necessary
- Superior miRNA yields and RT-PCR performance
- Parallel DNA isolation possible if needed

Product at a glance

	Mini NucleoSpin® miRNA Plasma
Technology	Silica membrane technology
Sample material	Plasma / serum (< 300 µL, < 900 µL with multiple loading steps)
Fragment size	≥ 18 nt
Elution volume	20 – 50 µL
Binding capacity	200 µg
Preparation time	40 min/10 preps (without rDNase digestion), 70 min/10 preps (with rDNase digestion)

Application data





Superior miRNA yields and RT-PCR performance

Purified miRNA (2 µL of each eluate) was used as template in quantitative realtime RT-PCR for miR-16 miRNA (Applied Biosystems, TaqMan® MicroRNA RT Kit, hsa-miR-16 MicroRNA Assay). The results show that C_T values are lowest for NucleoSpin® miRNA Plasma, indicating highest miRNA yields. As a result, NucleoSpin® miRNA Plasma shows superior performance with or without optional DNase digestion.

Highly efficient DNA removal

Residual genomic DNA was estimated by qPCR of a 102 bp fragment of the elongation factor 1 gene using the 2x DyNAmo™ Capillary Master Mix (Finnzymes). There was no genomic DNA background detectable when performing the optional DNase digestion. By omitting the DNA digestion predominantly small genomic DNA can be isolated from plasma and serum. Up to 1000 bp fragments are purified very efficiently while very large fragments from lysed white blood cells are removed in the protein precipitation step.

Reference

Nakumara et al. 2017 "Serum microRNA-122 and Wisteria floribunda agglutinin-positive Mac-2 binding protein are useful tools for liquid biopsy of the patients with hepatitis B virus and advanced liver fibrosis." *PLOS ONE*

Ordering infromation

Product	Preps	REF
NucleoSpin® miRNA Plasma	10 / 50 / 250	740981.10 / .50 / .250
Related products		
Exosome Precipitation Solution (Serum / Plasma)*	2 mL / 12 mL / 60 mL	740398.2 / .12 / .60
Exosome Precipitation Solution (Urine)*	12 mL / 20 mL / 250 mL	740399.12 / .50 / .250

* Not available in USA

Nucleic acid purification from FFPE

NucleoSpin® DNA FFPE XS

Recovery of nucleic acids from formalin-fixed, paraffin-embedded samples

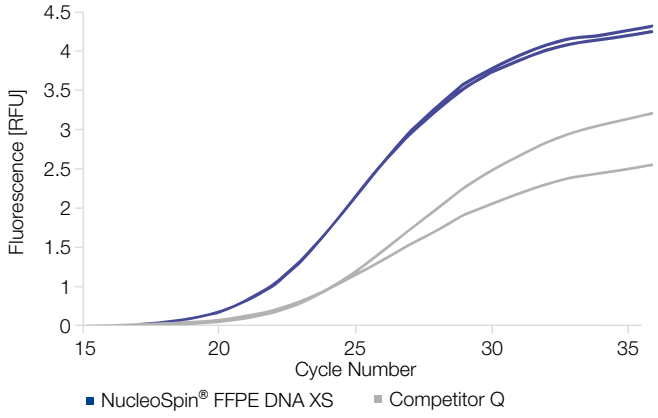
- Odorless paraffin removal by patented Paraffin Dissolver – xylene free
- Efficient decrosslinking for improved downstream performance (qPCR)

Patented technology

Product at a glance

	NucleoSpin® DNA FFPE XS
Technology	Silica membrane technology
Sample material	≤ 7 sections (10 µm) of 250 mm² total area (< 15 mg paraffin)
Fragment size	50 bp – approx. 50 kbp
Typical yield	Depending on sample amount and quality
Elution volume	5 – 30 µL
Preparation time	70 min/6 preps (excl. lysis)

Application data



Outstanding PCR performance due to efficient recovery of decrosslinked DNA

DNA was isolated from formalin-fixed and paraffin-embedded rat liver tissue with NucleoSpin® FFPE DNA (2x blue graphs) and with a FFPE mini elution kit from competitor Q (2x grey graphs). DNA isolated with NucleoSpin® FFPE DNA is consistenly high in yields and shows better performance in the PCR reaction than the competitor kit.

Roche LightCycler® real-time PCR, target length: 100 bp. Starting material each: 1 section FFPE rat liver; overnight lysis; 30 µL elution volume.

Deparaffinize with Paraffin Dissolver | Lyse sample | Decrosslink | Bind and Wash | Snap off column

References

Mori R. et al. The diagnosis of a metastatic breast tumor from ovarian cancer by the succession of a p53 mutation: a case report. *World Journal of Surgical Oncology* 2017.

Hirvonen E. A. M. et al. Whole-exome sequencing identifies novel candidate predisposition genes for familial polycythemia vera. *Human Genomics* 2017

Ordering information

Product	Preps	REF
NucleoSpin® DNA FFPE XS	10 / 50 / 250	740980.10 / .50 / .250

Nucleic acid purification from FFPE

NucleicSpin® 8/96 DNA FFPE

Xylene-free, medium to high throughput isolation of DNA from FFPE samples

- Patented, xylene-free paraffin dissolver included for convenient processing
- Special de-crosslinking buffer ensures high DNA yields from formalin fixed samples

Patented technology

Product at a glance

	8-well NucleoSpin® 8 DNA FFPE	96-well NucleoSpin® 96 DNA FFPE
Technology	Silica membrane technology	Silica membrane technology
Sample material	< 10 mg tissue / 7 sections (10 µm) of 250 mm^2 total area (< 15 mg paraffin)	< 10 mg tissue / 7 sections (10 µm) of 250 mm^2 total area (< 15 mg paraffin)
Fragment size	50 bp – 5 kbp	50 bp – 5 kbp
Elution volume	100 µL	100 µL
Theoretical binding capacity	20 µg	20 µg
Preparation time	60 min/6 strips (excl. lysis)	60 min/plate (excl. lysis)

Ordering information

Product	Preps	REF
NucleoSpin® 8 DNA FFPE	12 x 8 / 60 x 8	740242 / .5
NucleoSpin® 96 DNA FFPE	1 x 96 / 4 x 96	740240.1 / .4

Nucleic acid purification from FFPE

NucleoMag® DNA FFPE

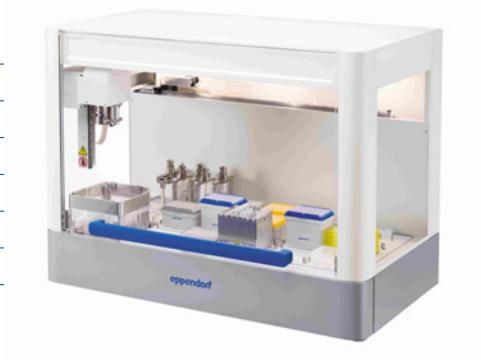
DNA isolation from FFPE samples

- Patented, xylene-free paraffin dissolver included for convenient processing
- Special de-crosslinking buffer ensures high DNA yields from formalin fixed samples
- Support protocol for isolation of RNA available

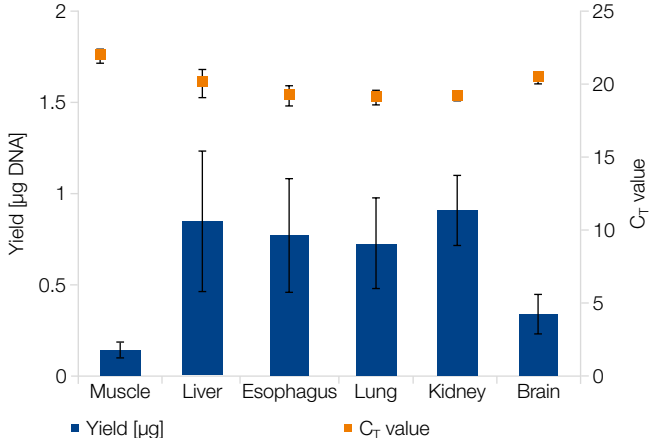
Patented technology

Product at a glance

	Mag NucleoMag® DNA FFPE
Technology	Magnetic bead technology
Sample material	≤ 5 mg tissue (≤ 15 mg paraffin)
Fragment size	50 bp – 5 kbp
Typical yield	Depending on amount and quality of sample
Elution volume	> 25 µL
Preparation time	40 – 120 min/96 preps (excl. lysis)

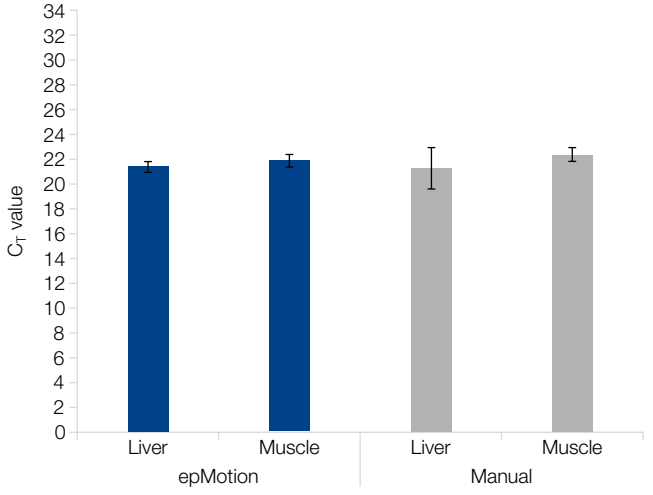


Application data



Automated isolation of DNA from various mouse FFPE samples

DNA was isolated from various mouse FFPE samples (n = 4; approximate section size muscle: 1 mm²; liver: 12 mm²; esophagus: 3 mm²; lung: 5 mm²; kidney: 8 mm²; brain: 4.5 mm²) using the NucleoMag® DNA FFPE kit on an ep*Motion*® 5075t system. The total yield was determined by UV spectrometry (dark blue bars). A subsequent qPCR analysis was performed with a Taqman® Probe for a GAPDH amplicon. The results demonstrate a reliable qPCR-performance for all tested mouse FFPE samples.



Comparison of automated and manual processing

DNA was isolated from mouse FFPE samples (n= 4; approximate 10 mg paraffin each) using the NucleoMag® DNA FFPE kit in an automated manner on an epMotion® 5075t system (dark blue bars) or manually (grey bars). A subsequent qPCR analysis was performed with a Taqman® Probe for a GAPDH amplicon. The results demonstrate a reliable performance of the established, automated method with a smaller standard deviation than with manual processing.

Ordering information

Product	Preps	REF
NucleoMag® DNA FFPE	1 x 96 / 4 x 96	744320.1 / .4

Nucleic acid purification from FFPE

NucleoSpin® totalRNA FFPE · NucleoSpin® totalRNA FFPE XS

Nucleic acids recovery from formalin-fixed, paraffin-embedded samples

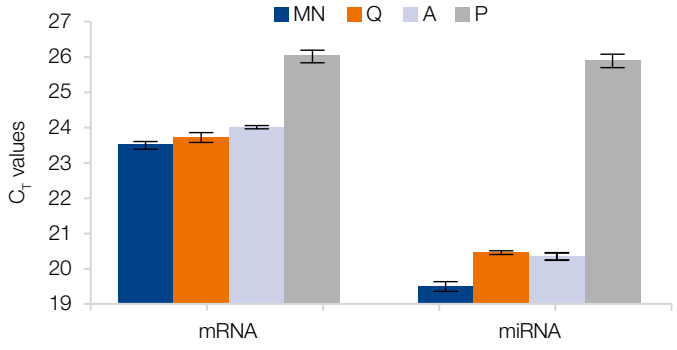
- Odorless paraffin removal by patented Paraffin Dissolver – xylene free
- Efficient decrosslinking for improved downstream performance (qPCR)

Patented technology

Products at a glance

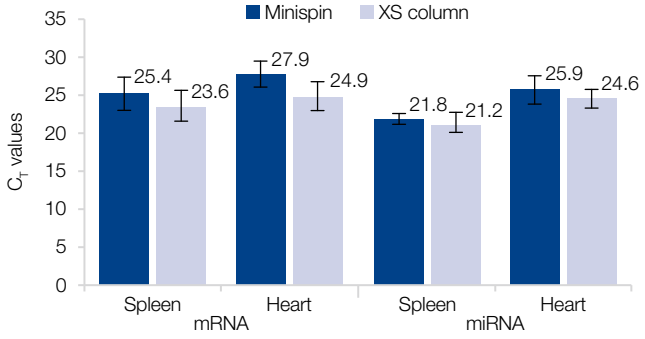
	Midi NucleoSpin® totalRNA FFPE	XS NucleoSpin® totalRNA FFPE XS
Technology	Silica membrane technology	Silica membrane technology
Sample material	FFPE, Fixed samples, Tissue sections	FFPE, Fixed samples, Tissue sections
Fragment size	> 18 nt	> 18 nt
Typical yields	Depending on sample amount and quality	Depending on sample amount and quality
Elution volume	30 – 50 µL	5 – 30 µL
Preparation time	70 min/6 preps	70 min/6 preps

Application data



Excellent RT-PCR performance and most efficient gDNA removal with NucleoSpin totalRNA FFPE

Large (e. g., mRNA) and small (e. g., miRNA) RNA was isolated from 4 x 10 µm FFPE sections of mouse brain tissue with NucleoSpin totalRNA FFPE and compared to three other competitor kits (Q, A, P). (left) Quantification of mRNA* and miRNA** was performed by qRT-PCR. Low CT values indicate high RNA yields.



Higher concentration of total RNA obtained from XS columns for efficient sensitivity in qRT-PCR from very small FFPE sample amounts

Trace amount of FFPE samples (1 x 15 µm mouse spleen and 1 x 10 µm mouse heart) were used for the isolation of mRNA and miRNA with NucleoSpin totalRNA FFPE and NucleoSpin totalRNA FFPE XS.

Ordering information

Product	Preps	REF
NucleoSpin® totalRNA FFPE	10 / 50 / 250	740982.10 / .50 / .250
NucleoSpin® totalRNA FFPE XS	10 / 50 / 250	740969.10 / .50 / .250

Nucleic purification from stool samples

NucleoSpin® DNA Stool

Isolation of genomic DNA or RNA from stool samples

- Ceramic beads for superior lysis
- Highly efficient NucleoSpin® Inhibitor Removal Column

MN Bead Tubes included

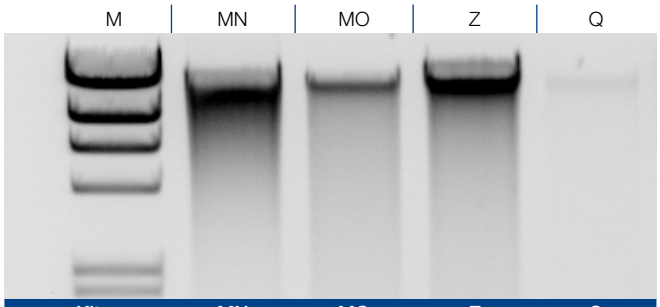
Product at a glance

	Mini NucleoSpin® DNA Stool
Technology	Silica membrane technology
Sample material	~ 200 mg fresh or frozen stool samples
Fragment size	200 bp – approx. 50 kbp
Typical yields	Depends on sample type & quality
Elution volume	30 – 100 µL
Preparation Time	60 min/10 preps (excluding lysis)

References

Högberg, N. et al. Assessment of three DNA extraction kits for the absolute quantification of strongyle nematode eggs in faecal samples. *Acta Veterinaria Scandinavica 2022*

Application data



Kit	MN	MO	Z	Q
$A_{260/280}$	1.8	1.7	1.5	1.9
$A_{260/230}$	2.1	1.6	1.2	1.9
DNA yield (µg)	9.2	5.8	6.9	7.4

High genomic DNA yield, and purity from human stool samples

DNA was isolated from human stool samples with the NucleoSpin DNA Stool kit (MN) and with competitor products (MO, Z, Q). The DNA was extracted according to manufacturer's protocols, and 5 % of the eluate was subjected to gel electrophoresis. DNA yield, and quality of the samples shown in (A) were assessed by means of UV absorption measurement. The genomic DNA isolated with the NucleoSpin DNA Stool kit showed superior yield, and quality.

Ordering information

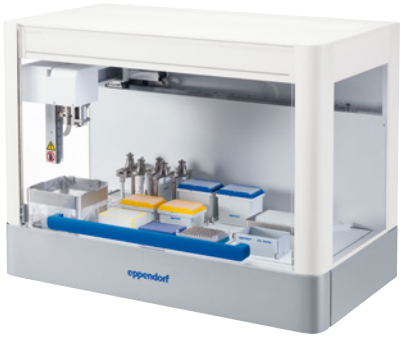
Product	Preps	REF
NucleoSpin® DNA Stool	10 / 50 / 250	740472.10 / .50 / .250

Nucleic acid purification from stool

NucleoSpin® 96 Stool

Isolation of DNA from stool samples in a 96 well-plate format

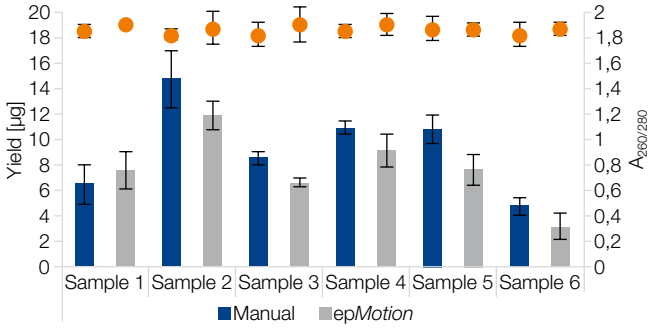
- Sample homogenization with MN bead tubes
- Robust filtration reduces the chance of column clogging

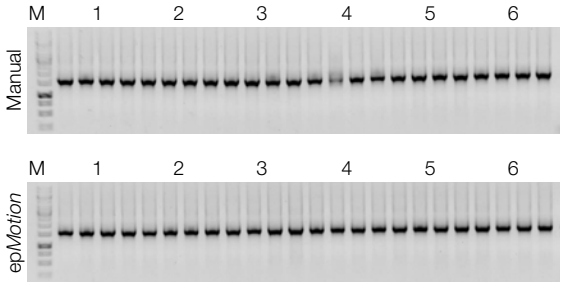


Product at a glance

	Spin NucleoSpin® 96 Stool
Technology	Silica membrane technology
Sample material	< 200 mg human and animal stool samples
Fragment size	50 bp – approx. 50 kbp
Typical yields	3 – 15 µg (varies by sample and disruption device)
Elution volume	150 µL
Preparation Time	100 min per 96 preps (lysis excluded)

Application data





Comparable performance both manually and on epMotion® 5075v

Six individual human stool samples were processed manually and on *epMotion*® 5075v in quadruplicates. Yield (blue/grey bars) and purity ($A_{260}/_{280}$ nm, orange dots) were measured for all of the preparations. The manual and automated extractions delivered comparable yields with high purity ($A_{260}/_{280}$ > 1.7 in all samples).

Consistently excellent PCR performance

Six individual human stool samples were processed manually and on *epMotion*® 5075v in quadruplicates. From each eluate, 2,5 µL were used in a 25 µL endpoint PCR reaction, amplifying a 1,5 kb fragment of the bacterial 16SrRNA gene. Three µL from each PCR reaction were analyzed on a 1 % agarose/TAE gel. In each case, the samples were successfully amplified, providing a good indication for the robust performance of the DNA in downstream applications.

Ordering information

Product	Preps	REF
NucleoSpin® 96 DNA Stool	1 x 96 / 4 x 96	740473.1 / .4
NucleoSpin® 96 DNA Stool Core Kit	4 x 96 / 24 x 96	740457.4 / .24

Nucleic acid purification from stool samples

NucleoSpin® RNA Stool

Isolation of RNA from stool samples

- Ceramic beads for superior lysis
- Highly efficient NucleoSpin® Inhibitor Removal Column

MN Bead Tubes included

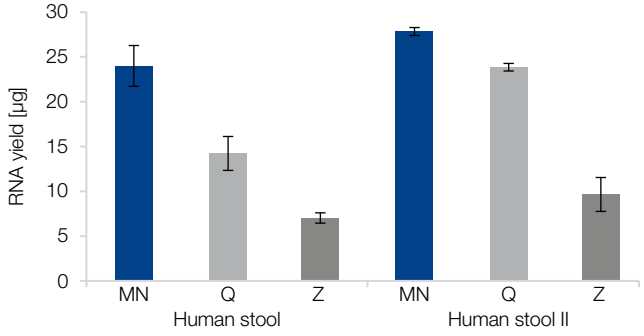
Product at a glance

	Mini NucleoSpin® RNA Stool
Technology	Silica membrane technology)
Sample material	~200 mg fresh or frozen stool samples
Fragment size	≥ 18 nt
Typical yields	10 – 30 µg
Elution volume	100 µL
Preparation time	70 min/10 preps (excluding lysis)

References

Reyes-Calderón, A. et al. Evaluation of low-cost SARS-CoV-2 RNA purification methods for viral quantification by RT-qPCR and next-generation sequencing analysis: Implications for wider wastewater-based epidemiology adoption. *Heliyon 2023*

Application data



Highest yield with NucleoSpin®

Two human stool samples (250 mg; MN only 200 mg) were processed in triplicates following the standard protocols including the DNase digestion step. The Q protocol was performed including the optional phenol based lysis step. Each eluate was used for UV spectroscopy to determine the RNA yield. The NucleoSpin® RNA Stool kit showed the highest RNA yield for human stool samples.

Ordering information

Product	Preps	REF
NucleoSpin® RNA Stool	10 / 50	740130.10 / .50

DNA purification from swabs samples

NucleoMag® DNA Swab

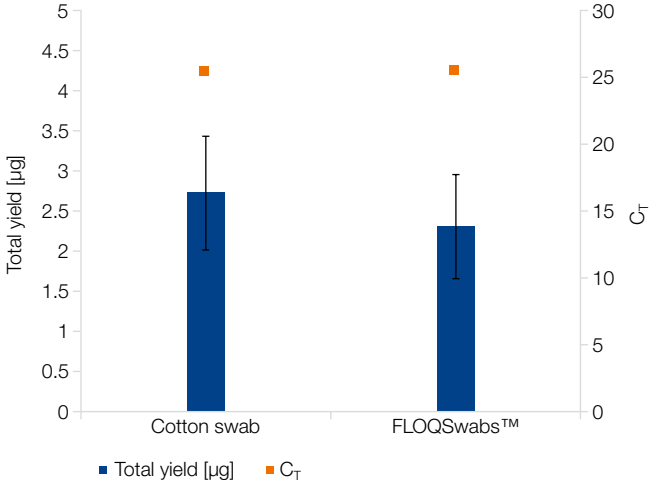
Isolation of genomic DNA from swabs

- High throughput DNA isolation for genetic testing
- Developed for cotton as well as synthetic swabs
- Combine with NucleoSpin® Forensic Filters for convenient sample prep

Product at a glance

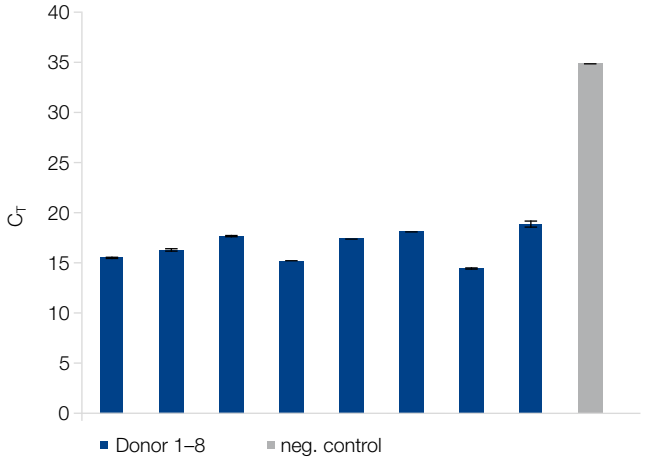
	Mag NucleoMag® DNA Swab
Technology	Magnetic Bead technology
Sample material	300 µL reconstituted swab lysate (cotton or synthetic swab)
Fragment size	> 300 bp – approx. 50 kbp, depending on sample processing
Typical yields	1 – 2 µg
Elution volume	50 – 100 µL
Preparation Time	40 – 120 min/96 preps (excluding lysis)

Application data



Human genomic DNA yield and qPCR performance from different swab types

Buccal swabs (standard cotton swabs and COPAN FLOQSwabs™) were collected from > 6 individuals. Lysates were prepared using NucleoSpin® Forensic Filters. DNA was isolated on a KingFisher® Flex platform according to the NucleoMag® DNA Swab standard protocol. qPCR performance was evaluated using the Quantifiler® Human DNA Quantification assay.



Sensitive detection of bacterial DNA in human specimens

DNA was isolated from mouth swabs on a KingFisher® Flex platform. qPCR targeting a bacterial 16S RNA gene demonstrates the sensitive detection of bacteria from swab specimens.

Ordering information

Product	Preps	REF
NucleoMag® DNA Swab	1 × 96 / 4 × 96 / 24 × 96	744601.1 / .4 / .24

Nucleic acid purification for *in-vitro* diagnostics

NucleoSpin® Dx Blood

For certified purification of DNA from fresh and frozen human whole blood samples

- CE-IVD certified – compliant with IVDR 2017/746 for in-vitro diagnostic applications*
- Compatible with citrate, EDTA and heparin blood collecting systems

Product at a glance

	Mini NucleoSpin® Dx Blood
Technology	Silica membrane technology
Sample material	Whole blood (200 µL)
Typical purity	Ratio A260/A280 1.7 – 1.9 Ratio A260/A230 1.8 – 2.3
Typical yields	3 – 5 µg (depending on individual blood sample)
Elution volume	50 – 200 µL
Preparation Time	30 min/prep (excluding lysis)

References

Komlósi, K. et al. Phenotypic variability in a Hungarian patient with the 4q21 microdeletion syndrome. *Molecular Cytogenetics 2015*

Ostrowska, M. et al. Identification of the c.829_832delAATA Deletion Variants in the BRCA1 Gene Associated with Hereditary Breast/Ovarian Cancer – Case Report. *Journal of Genomics 2022*

Ordering information

Product	Preps	REF
NucleoSpin® Dx Blood	50 / 250	740899.50 / .250

* CE-IVD marked kit: not available in the USA and other countries, please inquire.

Nucleic acid purification for *in-vitro* diagnostics

NucleoSpin® Dx RNA Blood

For certified purification of RNA from human blood stabilized with SARSTEDT's S-Monovette® RNA Exact

- CE-IVD certified – compliant with IVDR 2017/746 for in-vitro diagnostic applications*
- Intended for downstream analyses such as RT-PCR, qRT-PCR and RNA-Seq

Product at a glance

	Mini NucleoSpin® Dx RNA Blood
Technology	Silica membrane technology
Sample material	1.2 mL solution of stabilized blood from S-Monovette RNA Exact blood collection tubes (SARSTEDT REF 01.2048.001)
Fragment size	> 200 nt
Typical yields	> 1 µg per preparation from healthy subjects
Elution volume	40 µL or 60 µL
Preparation Time	55 min/6 preps (excluding lysis)

Ordering information

Product	Preps	REF
NucleoSpin® Dx RNA Blood*	50	740201.50

* CE-IVD marked kit: not available in the USA and other countries, please inquire.

SARSTEDT S-Monovette RNA Exact

Blood is a common source for RNA biomarkers, which are used for diagnostic purposes. They provide insight into the state of a disease of an individual.

However, RNA lacks stability and is easily degraded by ubiquitous enzymes called RNases. Unless they are inhibited, blood cells also respond to storage conditions after being drawn, therefore altering the original profile of biomarkers.

The SARSTEDT S-Monovette RNA Exact solves theses issues by both stabilizing any RNA in the sample as well as inhibiting the induction of gene expression after the blood is taken. Therefore, they allow for reliable storage and ensure standardized and exact results.

Nucleic acid purification for *in-vitro* diagnostics

NucleoSpin® Dx Virus

For certified purification of viral RNA and viral DNA from human serum and plasma

- CE-IVD certified – compliant with IVDR 2017/746 for in-vitro diagnostic applications*
- Compatible with fresh or frozen serum and plasma treated with EDTA or citrate
- Intended for downstream analyses such as RT-PCR, qRT-PCR and RNA-Seq

Product at a glance

	Mini NucleoSpin® Dx Virus
Technology	Silica membrane technology
Sample material	Plasma, serum
Fragment size	100 bp – approx. 50 kbp
Typical yields	Depending on sample amount and quality
Elution volume	50 µL
Preparation Time	30 min/6 preps (excluding lysis)

References

Azghandi, M. & Kerachian, M. A. Detection of novel coronavirus (SARS-CoV-2) RNA in peripheral blood specimens. *Journal of Translational Medicine 2020*

Balière, C. et al. Complete Genome Sequences of Monkeypox Virus from a French Clinical Sample and the Corresponding Isolated Strain, Obtained Using Nanopore Sequencing. *Microbiology Resource Announcements 2023*

Ordering information

Product	Preps	REF
NucleoSpin® Dx Virus*	50	740895.50

* CE-IVD marked kit: not available in the USA and other countries, please inquire.

Nucleic acid purification for *in-vitro* diagnostics

NucleoMag® Dx Pathogen

CE-IVD – Intended use for viral RNA from human respiratory swabs and saliva, as well as for viral RNA and viral DNA from human stool samples

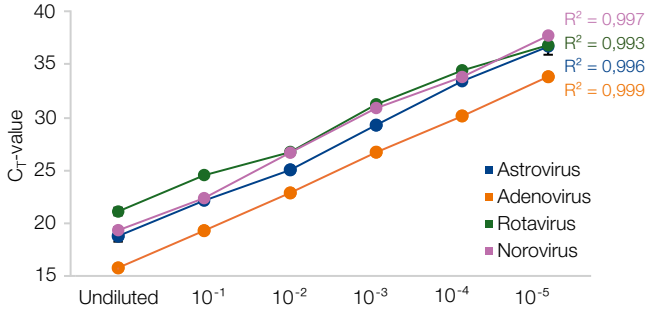
- CE-IVD certified – compliant with IVDR 2017/746 for in-vitro diagnostic applications
- Validated for SARS-CoV-2 diagnostic workflows
- Validated for raw human stool
- Intended for downstream PCR and sequencing applications

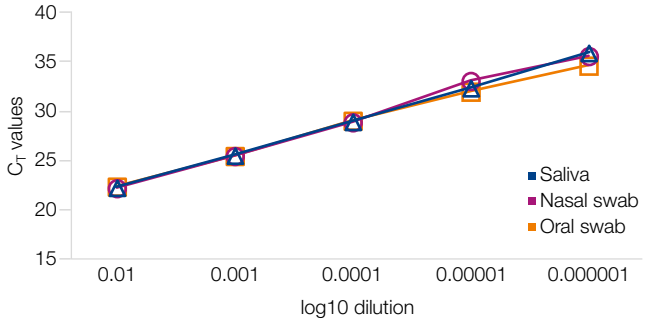
Intended use extended!

Product at a glance

	Mag NucleoMag® Dx Virus
Technology	Magnetic bead technology
Sample material	Human respiratory swabs (nasopharyngeal), human saliva, human raw stool
Fragment size	300 bp to approx. 50 kbp
Typical yields	Depending on sample amount and quality
Elution volume	50 µL to 100 µL
Preparation Time	40 min to 120 min per 96 preps, depending on the instruments/automation platform used

Application data





Sensitivity screening for pathogen detection from human stool samples

A six-fold dilution series was created from human stool samples. Viral RNA/DNA was extracted using the NucleoMag® Dx Pathogen kit and eluates were analyzed using the RIDA® GENE Viral Stool Panel I (R-Biopharm). Viral nucleic acids were detected over 6 order magnitude with an excellent linearity.

Consistent performance with different sample types

A dilution series of inactivated SARS-CoV-2 viruses was created in three different sample types (nasal swabs, oral swabs, saliva). RNA was extracted using the NucleoMag® Dx Pathogen on a KingFisher™ Flex system. Viral RNA was quantified via specific qRT-PCR (AgPath ID™ One Step RT PCR mix + nCoV IP4 assay, Institute Pasteur, Paris). Viral RNA was detected consistently and reliably over a a range of five log10 dilutions.

Ordering information

Product	Preps	REF
NucleoMag® Dx Pathogen*	4 x 96	744215.4

* CE-IVD marked kit: not available in the USA and other countries, please inquire.

RNA and DNA purification from clinical samples

Accessories

Product	Pack of	Specification	REF
NucleoVac 96 Vacuum Manifold	1	Vacuum manifold; consists of manifold base and lid, a spacer set and a waste container set for use with NucleoSpin® Midi / L Columns (see required Starter Set Midi below), for use of NucleoSpin® 8-well Strips (see required Starter Set A below)	740681
Starter Set Midi	1 set	For processing NucleoSpin® Midi /L Columns under vacuum on NucleoVac 96 Vacuum Manifold or similar manifolds; contains 1 Column Holder Midi, 1 Wash Plate Midi, 1 Elution Tube Holder Midi, 24 Dummy Columns Midi	740744
NucleoVac Vacuum Regulator	1	For controlling of vacuum pressure	740641
NucleoSpin® Dummy Strips	6 strips	For sealing unused rows of Column Holders A, B, and C using NucleoSpin® 8-well kits	740685
MN Frame	1	For optimized handling of 96-well plates with a vacuum manifold on BioRobot® 9600, 9604, and 3000 (Qiagen), MultiPROBE® II / Janus (PerkinElmer), Biomek® 2000 / 3000 and FX / NX (Beckman Coulter)	740680
MN Shaker Frame	1	Adapter frame for shaking Protino® and NucleoSpin® 96-well Plates	740489
NucleoMag® SEP	1	Magnetic separator, for use with 96-well plates (e. g., REF 740481)	744900
NucleoMag® SEP 24	1	Magnetic separator, for use with 24-well plates (e.g., REF 740448.4)	744903
Starter Set A	1	For processing NucleoSpin® 8-well strips under vacuum on a NucleoVac 96 Vacuum Manifold or similar manifolds; contains 2 Column Holders A, NucleoSpin® Dummy Strips	740682
Starter Set B	1	*For processing NucleoSpin® 8-well strips on the Qiagen Bio Robot® 9600 / 9604 / 3000 ; contains 1 Column Holder B, 1 Column Holder D, NucleoSpin® Dummy Strips*	740683
Starter Set C	1	*For processing NucleoSpin® 8-well strips under centrifugation; contains 2 Column Holders C, MN Square-well Blocks, Racks of Tube Strips*	740684

HTP consumables

Product	Pack of	Specification	REF
MN Wash Plate	4 24	96-well plates with funnel shaped wells to minimize the risk of cross-contamination using NucleoSpin® 8-well strips / 96-well plates under vacuum or gravity flow	740479 740479.24
Square-well Block	4 24	96-well blocks with 2.1 mL u-bottom square wells for use with NucleoMag® SEP	740481 740481.24
MN Square-well Block	4 24	96-well blocks with 2.1 mL square wells for mixing steps and waste collection using NucleoSpin® 8-well strips / 96-well plates under vacuum or centrifugation	740476 740476.24
Culture Plate	4 sets 24 sets	Square-well Blocks with 2.1 mL square wells, including Gas-permeable Foil for cultivation of bacteria in 96-well format	740488 740488.24
Round-well Block	20	96-well blocks with 1.2 mL round wells for sample lysis, mixing steps, and collection of elution fractions using NucleoSpin® 8-well strips / 96-well plates under vacuum; wells can be closed with Cap Strips	740671
Round-well Block with Cap Strips	4 sets 24 sets	1 set consists of 1 Round-well Block with 12 Cap Strips	740475 740475.24
Round-well Block Low, U-bottom	4 20	96-well blocks with 1.25 mL U-bottom round wells	740482 740482.20
Elution Plate U-bottom	24	96-well microplates with 300 µL u-bottom wells, including Self-adhering Foil	740486.24
24-Square-well Block 10 mL	4	24-well block with 10 mL deep square wells with silicone lid	740679.4
Rack of Tube Strips	5 sets	1 set consists of 1 rack, 12 strips with 8 tubes each for sample lysis, mixing steps, and collection of elution fractions using NucleoSpin® 8-well strips / 96-well plates under vacuum or centrifugation; strips can be closed with cap strips	740637
Rack of Tube Strips with Cap Strips	4 sets 24 sets	1 set consists of 1 rack, 12 strips with 8 tubes each, and 12 cap strips	740477 740477.24
Cap Strips	48 288	Strips with of 8 caps each for sealing of Tube Strips and Round-well Blocks	740478 740478.24
Gas-permeable Foil	50	Gas-permeable, self adhering foil for sealing of 96-well plates	740675
Self-adhering PE Foil	50	Adhesive tape foils for air-tight sealing and storage of 96-well elution plates	740676
NucleoSpin® Plasmid Filter Strips	48	8-well strips for clarification of lysates, for use under vacuum or centrifugation	740730.48F

RNA and DNA purification from clinical samples

NucleoSpin® RNA Filter Strips	12 60	8-well strips for filtration of cell and tissue homogenates; for use under vacuum or centrifugation	740699.12F 740699.60F
NucleoSpin® RNA Filter Plate	4	96-well plates for filtration of cell and tissue homogenates; for use under vacuum or centrifugation	740711
NucleoSpin® Trace Filter Plate	20	96-well plates for lysis of samples and subsequent removal of particulate matter; for use under vacuum or centrifugation	740677
Receiver Plates 35 µm	4	96-well plates with inserted filter frits of 35 µm pore size for general filtration purposes as well as for retaining chromatographic resins; suitable for centrifugation and use under vacuum	740512.4
Receiver Plates 35 µm hydrophilized	4	96-well plates with inserted hydrophilized filter frits of 35 µm pore size for general filtration purposes as well as for retaining chromatographic resins; suitable for gravity flow, centrifugation, and use under vacuum	740513.4
Receiver Plates 50 µm	4	96-well plates with inserted filter frits of 50 µm pore size for general filtration purposes as well as for retaining chromatographic resins; suitable for centrifugation and unse under vacuum	740688.4
Receiver Plates 50 µm hydrophilized	4	96-well plates with inserted hydrophilized filter frits of 50 µm pore size for general filtration purposes as well as for retaining chromatographic resins; suitable for gravity flow, centrifugation, and use under vacuum	740689.4
96-well Accessory Kit A for KingFisher®	1 set	KingFisher® Deep-well Blocks, KingFisher® Deep-well Tip Combs, KingFisher® Elution Plates, for 4 × 96 NucleoMag® Tissue / Trace / Forensic / DNA Food / DNA Forensic / DNA Swab / DNA/RNA Water / Pathogen / Virus / VET preps using KingFisher® Flex / 96 platform	744950
96-well Accessory Kit B for KingFisher®	1 set	KingFisher® Deep-well Blocks, KingFisher® Deep-well Tip Combs, KingFisher® Elution Plates, for 4 × 96 NucleoMag® Blood 200 µL and NucleoMag® Plant / RNA preps using KingFisher® Flex / 96 platform	744951
Deep-well Tip Combs for KingFisher®	4	96 Deep-well Tip Combs for use of NucleoMag® kits on KingFisher® platforms	744956
96 Deep-well plates for magnetic rod system	25	Deep-well plates for KingFisher®, Magnetapure32 Plus or IsoPure systems	744955
8-well Tip combs for magnetic rod systems	50	Tip combs for MagnetaPure32, 32 Plus and IsoPure Mini systems	744960

Single prep equipment

Product	Pack of	Specification	REF
NucleoVac 24 Vacuum Manifold	1	For vacuum-based processing. Contains a NucleoVac 24 Vacuum Manifold, 24 NucleoVac Mini Adapters, 24 Luer plugs, 2 tubing connections, 1 closing plug	740299
NucleoVac Vacuum Regulator	1	For controlling of vacuum	740641
NucleoMag® SEP Mini	1	Magnetic separator, for use with 1.5 mL or 2 mL reaction tubes (12 positions)	744901
NucleoMag® SEP Maxi	1	Magnetic separator, for use with 50 mL tubes (4 positions)	744902
MN Bead Tube Holder	1	To house up to 12 bead tubes in combination with a Vortex-Genie® instrument	740469

Enzymes and auxiliary tool

Product	Pack of	Specification	REF
Proteinase K	100 mg	Proteinase K and Proteinase Buffer PB	740506
Liquid Proteinase K	5 mL	Ready to use Liquid Proteinase K	740396
NucleoCard	10 / 100	Blood sample storage cards	740403.10 / .100

RNA and DNA purification from clinical samples

Ordering information

Product	Preps	REF
Nucleic acid purification from pathogens		
NucleoSpin® Virus	10 / 50 / 250	740983.10 / .50 / .250
NucleoSpin® RNA Virus	10 / 50 / 250	740956.10 / .50 / .250
NucleoSpin® 8 Virus	12 x 8 / 60 x 8	740643 / .5
NucleoSpin® 8 Virus Core Kit	48 x 8	740451.4
NucleoSpin® 96 Virus	2 x 96 / 4 x 96	740691.2 / .4
NucleoSpin® 96 Virus Core Kit	4 x 96	740452.4
NucleoMag® Virus	1 x 96 / 4 x 96	744800.1 / .4
NucleoMag® Pathogen	1 x 96 / 4 x 96	744210.1 / .4
Nucleic acid purification from blood		
NucleoSpin® Blood	10 / 50 / 250	740951.10 / .50 / .250
NucleoSpin® Blood L	20	740954.20
NucleoSpin® Blood XL	10 / 50	740950.10 / .50
NucleoSpin® 8 Blood	12 x 8 / 60 x 8	740664 / .5
NucleoSpin® 8 Blood Core Kit	48 x 8	740455.4
NucleoSpin® 96 Blood	1 x 96 / 4 x 96	740665.1 / .4
NucleoSpin® 96 Blood Core Kit	4 x 96	740456.4
NucleoSpin® Blood QuickPure	10 / 50 / 250	740569.10 / .50 / .250
NucleoSpin® 8 Blood QuickPure	12 x 8 / 60 x 8	740666 / .5
NucleoSpin® 96 Blood QuickPure	1 x 96 / 4 x 96 / 24 x 96	740667.1 / .4 / .24
NucleoMag® Blood 200 µL	1 x 96 / 4 x 96	744501.1 / .4
NucleoMag® Blood 3 mL	1 x 96	744502.1
NucleoSpin® RNA Blood	10 / 50	740200.10 / .50
NucleoSpin® RNA Blood Midi	20	740210.20
NucleoSpin® 8 RNA Blood	12 x 8 / 60 x 8	740220 / .5
NucleoSpin® 96 RNA Blood	2 x 96 / 4 x 96	740225.2 / .4
Nucleic acid purification from plasma		
NucleoSpin® cfDNA XS	10 / 50 / 250	740900.10 / .50 / .250
NucleoSpin® DNA cfDNA Midi	48	740303.48
NucleoSpin® DNA cfDNA Midi Core Kit	48	740302.48
NucleoSpin® 96 DNA cfDNA	1 x 96 / 4 x 96	740873.1 / .4
NucleoSpin® 96 DNA cfDNA Core Kit	1 x 96 / 4 x 96	740874.1 / .4
NucleoSnap® DNA cfDNA	10 / 50	740300.10 / .50
NucleoMag® DNA cfDNA	1 x 48/ 4 x 48	744550.1 / .4
NucleoSpin® miRNA Plasma	10 / 50 / 250	740981.10 / .50 / .250
DNA from FFPE samples		
NucleoSpin® DNA FFPE XS	10 / 50 / 250	740980.10 / .50 / .250
NucleoSpin® 96 DNA FFPE	1 x 96 / 4 x 96	740240.1 / .4
NucleoMag® DNA FFPE	1 x 96 / 4 x 96	744320.1 / .4
NucleoSpin® totalRNA FFPE XS	10 / 50 / 250	740969.10 / .50 / .250
NucleoSpin® totalRNA FFPE	10 / 50 / 250	740982.10 / .50 / .250
Nucleic acid purification from stool and swab samples		
NucleoSpin® DNA Stool	10 / 50 / 250	740472.10 / .50 / .250
NucleoSpin® 96 DNA Stool	1 x 96 / 4 x 96	740473.1 / .4
NucleoSpin® 96 DNA Stool Core Kit	4 x 96 / 24 x 96	740457.4 / .24
NucleoSpin® RNA Stool	10 / 50	740130.10 / .50
NucleoMag® DNA Swab	1 x 96 / 4 x 96 / 24 x 96	744601.1 / .4 / .24
Nucleic acid purification for in-vitro diagnostics		
NucleoSpin® Dx Blood*	50 / 250	740899.50 / .250
NucleoSpin® Dx RNA Blood	50	740201.50
NucleoSpin® Dx Virus*	50	740895.50
NucleoMag® Dx Pathogen	4 x 96	744215.4

* in accordence with the EU IVDR regulation 2017/746, not available in the USA and other countries, please inquire.

www.mn-net.com

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