Bioanalysis

MACHEREY-NAGEL

RNA and DNA purification from clinical samples

Reliable purification of high quality RNA and DNA

- 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

RNA and DNA 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 their various parasites 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 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.

RNA and DNA purification from clinical samples

Kits for nucleic acid purification from clinical samples

Sample material	Target	Scale	Product	Page
Cell-free fluids	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
Blood	DNA	Mini	NucleoSpin® Blood	8
		Midi/Maxi	NucleoSpin® Blood L/XL	8
		8-well strip/96-well plate	NucleoSpin® 8/96 Blood	9
		Flexible	NucleoMag® Blood 200 µL	10
		Flexible	NucleoMag® Blood 3 mL	10
	RNA	Mini	NucleoSpin® RNA Blood	11
		Midi	NucleoSpin® RNA Blood Midi	11
		8-well strip/96-well plate	NucleoSpin® 8/96 RNA Blood	11
Plasma	DNA	Micro	NucleoSpin® Plasma XS	12
		Midi	NucleoSpin® Plasma Midi	12
		Snap	NucleoSnap® DNA Plasma	13
		96-well plate	NucleoSpin® 96 DNA Plasma	12
		Flexible	NucleoMag® DNA Plasma	12
	RNA	Mini	NucleoSpin® miRNA Plasma	14
FFPE	DNA	XS	NucleoSpin® DNA FFPE XS	15
		96-well plate	NucleoSpin® 96 DNA FFPE	15
		Flexible	NucleoMag® DNA FFPE	15
	RNA	XS	NucleoSpin® totalRNA FFPE XS	15
		Mini	NucleoSpin® totalRNA FFPE	15
Stool	DNA	Mini	NucleoSpin® DNA Stool	16
	RNA	Mini	NucleoSpin® RNA Stool	16
IVD	DNA	Mini	NucleoSpin® Dx Blood	17
	RNA/DNA	Mini	NucleoSpin® Dx Virus	17

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

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

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

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

Superparamagnetic beads

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)

Mini spin columns in 8-well strip format

Mini spin columns in 96-well plate format

Nucleic acid purification from cell-free fluids

NucleoSpin® Virus

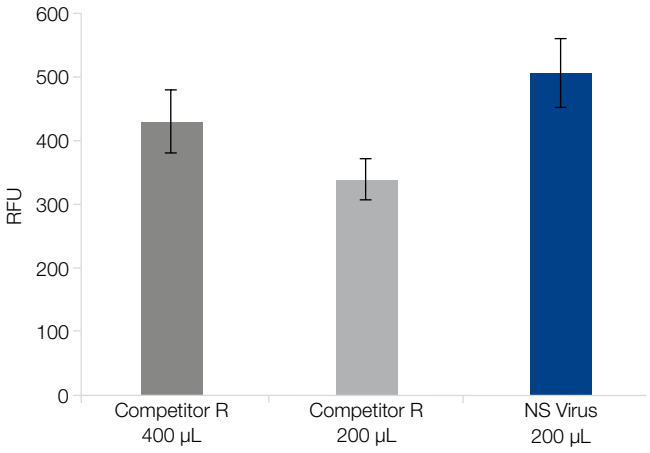
Reliable viral RNA and DNA purification with one kit

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

Product at a glance

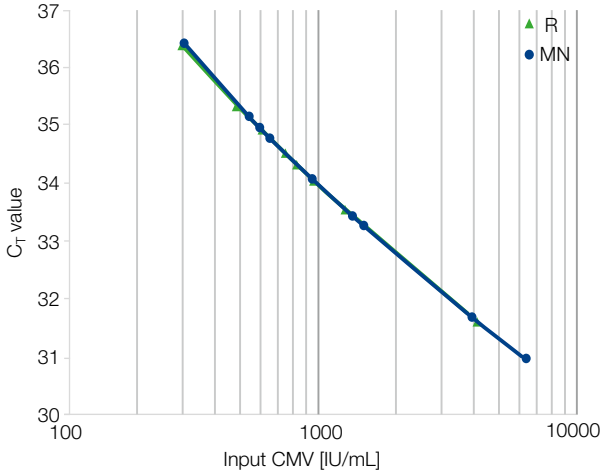
	Mini NucleoSpin® Virus
Technology	Silica membrane technology
Sample material	Cell-free biological fluids, swabs, and tissue homogenates (< 200 µL; < 400 µL with two loading steps)
Fragment size	100 bp–approx. 50 kbp
Elution volume	30 µL
Binding capacity	25 µg
Preparation time	50 min/6 preps

Application data



Superior yields from smaller sample sizes

NucleoSpin® Virus kit shows higher yields than competitor R for extracting enteroviral RNA from plasma. The yield remains higher even when a double 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 C_T 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 et al. 2017 “Deep sequencing is an appropriate tool for the selection of unique Hepatitis C virus (HCV) variants after single genomic amplification.”

PLOS ONE

Ordering information

Product	Preps	REF
NucleoSpin® Virus	10 / 50 / 250	740983.10 / .50 / .250
Related products		
NucleoSpin® Dx Virus*	50	740895.50
NucleoSpin RNA Virus (isolation of viral RNA only)	10 / 50 / 250	740956.10 / .50 / .250

* CE-IVD marked kit: not available in all countries, please inquire.

Nucleic acid purification from cell-free fluids

NucleoSpin® 8/96 Virus

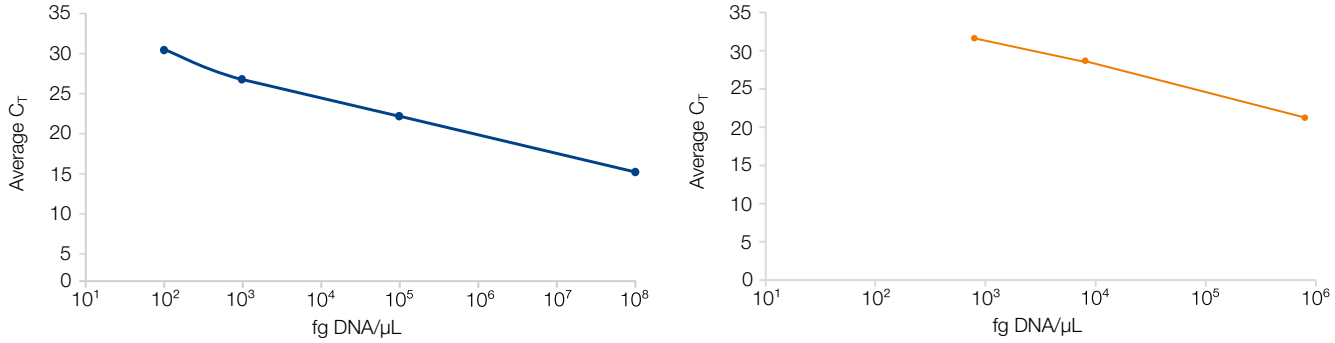
Silica membrane based isolation of viral RNA/DNA from cell-free biological fluids

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

Product at a glance

	NucleoSpin® 8 Virus	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
Recovery	> 90 %	> 90 %
Elution volume	70–100 µL	70–100 µL
Binding capacity	40 µg	40 µg
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 et al. 2017 “Epidemiology of Chikungunya Virus Outbreaks in Guadeloupe and Martinique, 2014: An Observational Study in Volunteer Blood Donors.”

PLOS Neglected Tropical Diseases

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® 96 Virus Core Kit*	4 x 96	740452.4
Related product	**Pack of**	**REF**
Liquid Proteinase K	5 mL	740396

* Kits with basic content focusing on automation platforms. 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 highest sensitivities for virus detection
- Complete processing at room temperature facilitates automation

Product at a glance

	Mag NucleoMag® Virus
Technology	Magnetic bead technology
Sample material	Biological fluids (< 200 µL)
Fragment size	300 bp–approx. 50 kbp
Elution volume	50–100 µL
Binding capacity	0.4 µg/µL beads
Preparation time	45 min/96 preps*

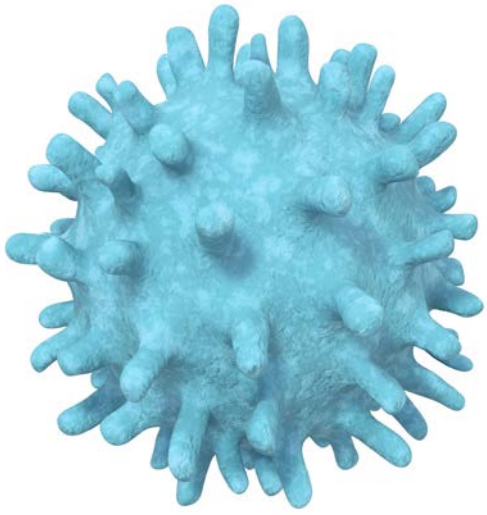
* Established on KingFisher® Flex.

Reference

Gallian et al., 2016 "Zika virus in asymptomatic blood donors, Martinique: 2016 "
Blood

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

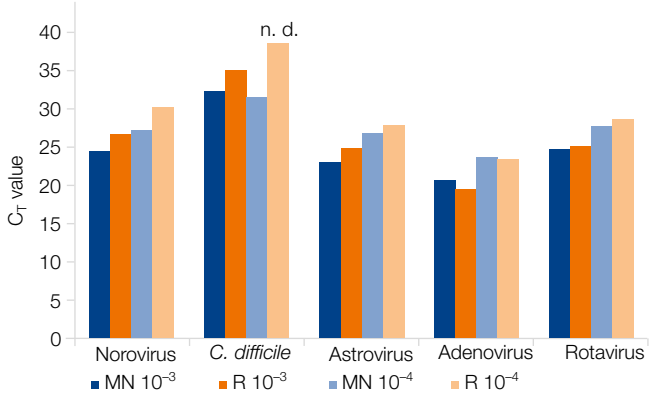
- One kit for any common clinical sample type
- High sensitivity even for low viral titers
- Proteinase K, Carrier RNA, and all buffers ready to use

Product at a glance

	Mag NucleoMag® Pathogen
Technology	Magnetic bead technology
Sample material	Scalable. A convenient volume, especially for 96-well processing would be: < 200 µL whole blood, serum, plasma, < 25 mg tissue (e.g., ear notches), < 200 µL feces, < 200 µL swab wash solution
Maximum amount of starting material in purification procedure	200 µL liquid/homogenized sample
Fragment size	300 bp–approx. 50 kbp
Elution volume	50–100 µL
Binding capacity	0.4 µg/µL beads
Preparation time	45 min/96 preps*

* Established on KingFisher® Flex.

Application data



NucleoMag® Pathogen is reliably sensitive even for challenging samples

Sensivity screening was performed for pathogen detection in human feces samples. Extraction was performed with the NucleoMag® Pathogen kit and the competitor kit "R". NucleoMag® Pathogen displays high sensitivity for various viruses and hard to lyse bacteria such as ***C. difficile*** measured in triplicates across a dilution series of 10^{-3}–10^{-4}.

Customer testimonal

"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)

Ordering information

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

Nucleic acid purification from blood

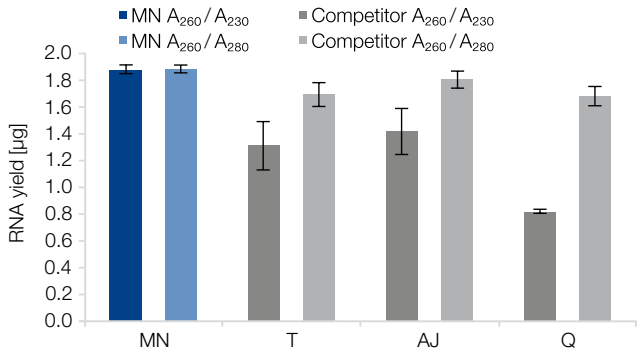
NucleoSpin® Blood

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

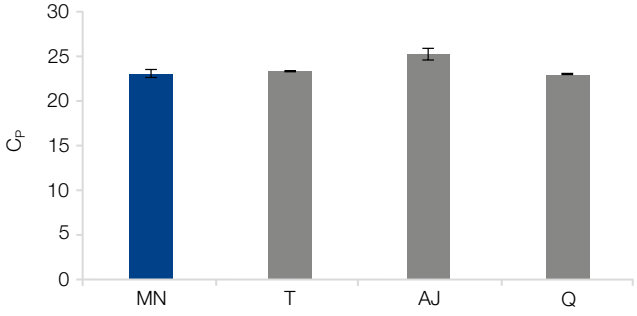
	Mini NucleoSpin® Blood	Midi NucleoSpin® Blood L	Maxi NucleoSpin® Blood XL
Technology	Silica membrane technology	Silica membrane technology	Silica membrane technology
Sample material	Blood (5–200 µL), human / animal cells (< 5 x 10^6)	Blood (0.2–2 mL), human / animal cells (2 x 10^7)	Blood (2–10 mL), 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 et al. 2017 “Discovery of stimulation-responsive immune enhancers with CRISPR activation.”

Nature

Pfeifer et al. 2015 “Telomerase activation by genomic rearrangements in high-risk neuroblastoma.”

Nature

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
Related product		
NucleoSpin® Dx Blood*	50 / 250	740899.50 / .250

* CE-IVD marked kit: not available in all countries, please inquire.

Nucleic acid purification from blood

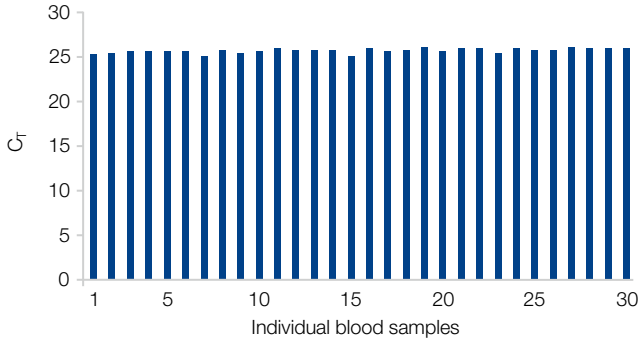
NucleoSpin® 8/96 Blood

Silica membrane based isolation of DNA from blood

- Complete processing at room temperature
- Improved flow rates minimize risk of clogging
- Highly uniform yields ensure a reliable prep

	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 10^6)	Blood (< 200 µL), human / animal cells (2 x 10^6)
Fragment size	300 bp–approx. 50 kbp	300 bp–approx. 50 kbp
Typical yield	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 et al. 2016 “Serological and Genetic Evidence for Altered Complement System Functionality in Systemic Lupus Erythematosus: Findings of the GAPAID Consortium.”

PLOS ONE

Secq et al. 2014 “Triple negative breast carcinoma EGFR amplification is not associated with EGFR, Kras or ALK mutations.”

British Journal of Cancer

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

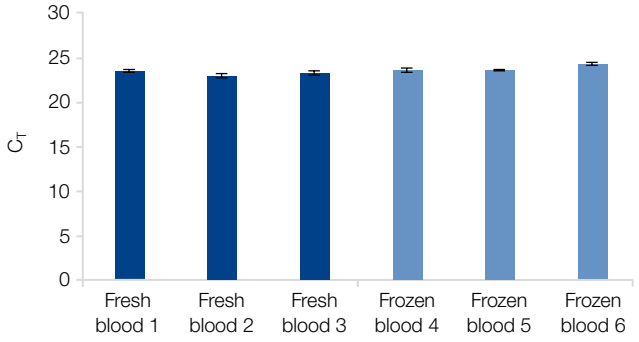
NucleoMag® Blood

Magnetic bead based isolation of genomic DNA from whole blood

- Small sized magnetic beads for optimized homogenious DNA binding
- Complete processing at room temperature and easy adaption to automated use
- Reliable qPCR results from both fresh and frozen blood samples

	Mag NucleoMag® Blood 200 µL	Mag NucleoMag® Blood 3 mL
Technology	Magnetic bead technology	Magnetic bead technology
Sample material	Blood (< 200 µL)	Blood (< 3 mL)
Fragment size	300 bp–approx. 50 kbp	300 bp–approx. 50 kbp
Typical yield	2–8 µg (200 µL blood)	100–130 µg (3 mL blood)
Elution volume	50–100 µL	1000 µL
Binding capacity	0.4 µg/µL beads	0.4 µg/µL beads
Preparation time	45 min/96 preps	60 min/24 preps

Application data



Reliable qPCR results from both fresh and frozen blood samples using NucleoMag® Blood 200 µL

DNA was extracted from three different samples of fresh blood and three different samples of frozen blood. Analysis by qPCR confirms a high level of uniformity between all six different blood samples.

Reference

Wiers et al. 2015 “Effects of depressive symptoms and peripheral DAT methylation on neural reactivity to alcohol cues in alcoholism”

Translational Psychiatry

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

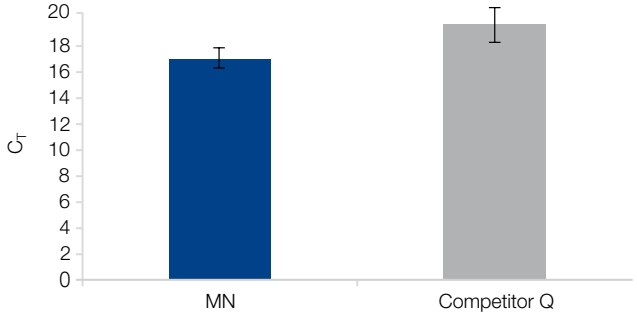
Mini and Midi spin kit for RNA isolation from fresh and frozen whole blood

- 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

	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)
A_{260}/A_{280}	1.9–2.1	1.9–2.1
Elution volume	40–120 µL	200–400 mL
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
Related products		
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

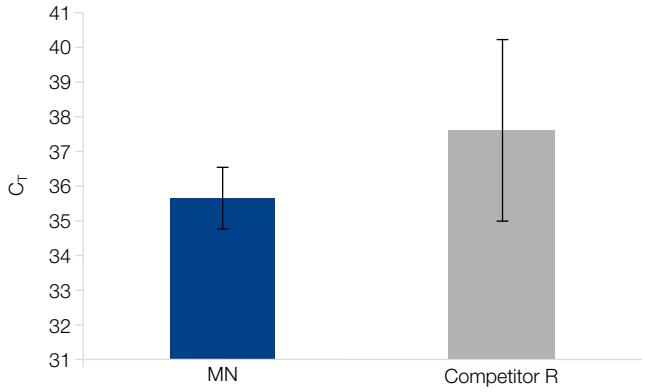
NucleoSpin® DNA Plasma XS · NucleoSpin® DNA Plasma Midi

Efficient isolation of cell-free DNA from single spin to high throughput format

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

	XS NucleoSpin® Plasma XS	Midi NucleoSpin® DNA Plasma 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. 2017 “Cell-Free DNA Provides a Good Representation of the Tumor Genome Despite Its Biased Fragmentation Patterns.”

PLOS ONE

Yi et al. 2014 “Increased plasma cell-free DNA level during HTNV infection: correlation with disease severity and virus load.”

Viruses

Ordering information

Product	Preps	REF
NucleoSpin® Plasma XS	10 / 50 / 250	740900.10 / .50 / .250
NucleoSpin® DNA Plasma Midi	48	740303.48
NucleoSpin® DNA Plasma Midi Core Kit*	48	740302.48.
Related products		
NucleoSpin® 96 DNA Plasma	1 x 96 / 4 x 96	740873.1 / .4
NucleoSpin® 96 DNA Plasma Core Kit*	1 x 96 / 4 x 96	740874.1 / .4
NucleoMag® DNA Plasma	1 x 48 / 4 x 48	744550.1 / .4

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

Nucleic acid purification from plasma

NucleoSnap® DNA Plasma

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

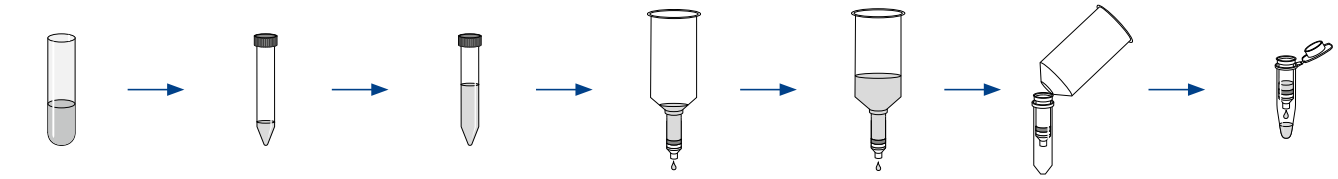
- Snap off column for quick vacuum processing of large sample volumes
- Optimized protocol for Cell-free DNA BCT® (Streck)

New column design

	Snap NucleoSnap® DNA Plasma
Technology	Precipitation and filtration
Sample material	Plasma / 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)

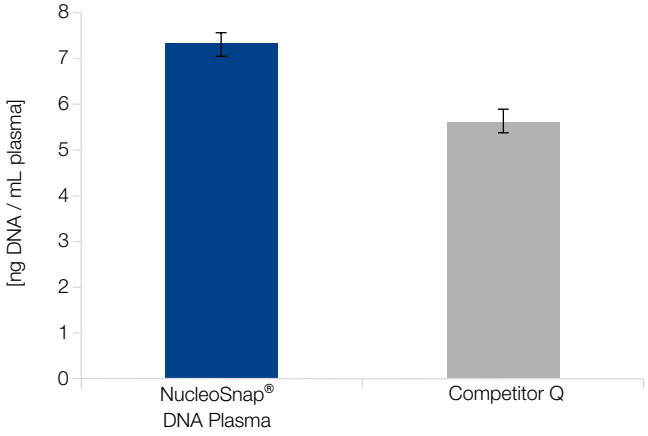
* For processing volumes larger than 5 mL, additional lysis buffer and Proteinase K have to be ordered separately. Please refer to the corresponding user manual.

Procedure



Prepare sample → Lyse sample → Prepare binding conditions → Bind DNA using a vacuum manifold → Wash using a vacuum manifold → Snap off column → Elute in a centrifuge

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 a 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

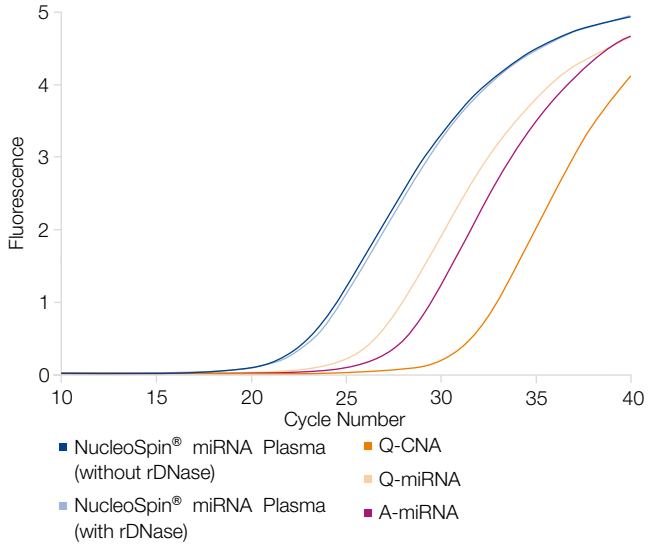
NucleoSpin® miRNA Plasma

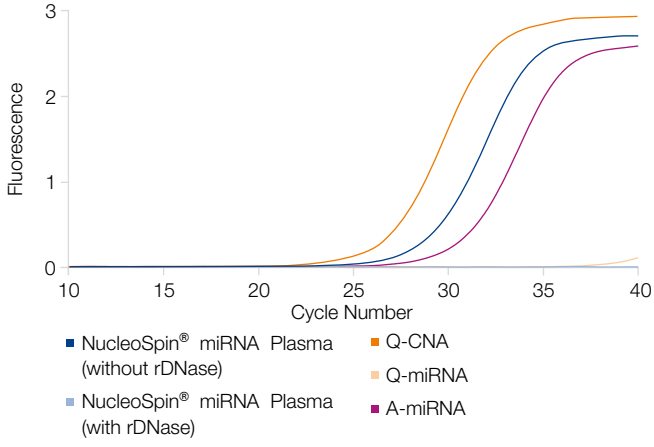
Mini spin kit for isolation of small RNA and DNA from plasma, serum, and exosomes

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

	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 performence

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 information

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 · NucleoSpin® totalRNA FFPE XS

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

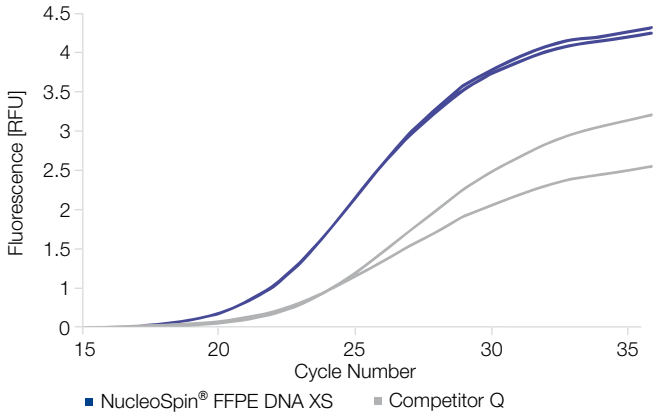
- Odorless paraffin removal by patented Paraffin Dissolver – xylene free
- Efficient decrosslinking for improved downstream performance (qPCR)
- Available for different formats and technologies

Patented technology

	XS NucleoSpin® DNA FFPE XS	XS NucleoSpin® totalRNA FFPE XS
Technology	Silica membrane technology	Silica membrane technology
Sample material	≤ 7 sections (10 µm) of 250 mm² total area (< 15 mg paraffin*)	≤ 10 sections (10 µm) with < 5 mg of tissue
Typical yield	Depending on sample amount and quality	Depending on sample amount and quality
Elution volume	5–30 µL	5-30 µL
Binding capacity	50 µg	100 µg
Preparation time	70 min/6 preps (excl. lysis)	70 min/6 preps (90 min incl. optional rDNase digestion)

* When using the standard protocol with Paraffin Dissolver. Larger quantities of paraffin can be processed when using additional Paraffin Dissolver or the protocol with xylene for deparaffinization.

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, orange graphs). DNA, isolated with NucleoSpin® FFPE DNA is consistently 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.

References

Mori et al. 2017 "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

Hirvonen et al. "Whole-exome sequencing identifies novel candidate predisposition genes for familial polycythemia vera."

Human Genomics

Ordering information

Product	Preps	REF
NucleoSpin® DNA FFPE XS	10 / 50 / 250	740980.10 / .50 / .250
NucleoSpin® totalRNA FFPE XS	10 / 50 / 250	740969.10 / .50 / .250
Related products		
NucleoSpin® totalRNA FFPE	10 / 50 / 250	740982.10 / .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

Nucleic acid purification from stool

NucleoSpin® RNA Stool

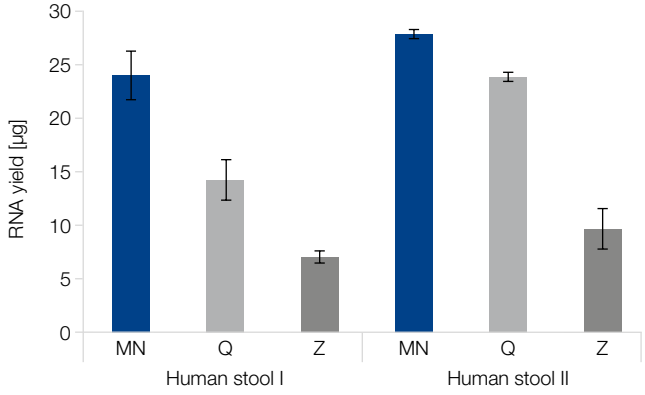
Fast isolation of total RNA from various stool samples

- Ceramic beads for superior sample lysis
- Highly efficient inhibitor removal by NucleoSpin® Inhibitor Removal Column
- Suitable for a variety of downstream applications (RT-PCR, northern blot, primer extensions, protease protection assays)

NucleoSpin® Bead Tubes included

	Mini NucleoSpin® RNA Stool
Technology	Silica membrane technology combined with NucleoSpin® Bead Tube Type A (ceramic beads)
Sample material	~200 mg fresh or frozen stool samples
Fragment size	≥ 18 nt
Typical yield	10–30 µg
A_{260}/A_{280}	1.9–2.1
RIN	> 7.5
Elution volume	100 µL
Binding capacity	200 µg
Preparation time	70 min/10 preps

Application data



Highest yield with NucleoSpin® RNA Stool

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	740472.10 / .50
Related products		
NucleoZOL	200 mL	740404.200
NucleoSpin® DNA Stool	10 / 50	740130.10 / .50

Nucleic acid purification for *in-vitro* diagnostics

NucleoSpin® Dx Blood · NucleoSpin® Dx Virus

For certified purification of high quality nucleic acids

- CE-IVD certification in compliance with EU directive 98 / 79/EC for *in-vitro* diagnostic applications*
- NucleoSpin® Dx Blood: Compatible with all stabilization substances (citrate, EDTA, heparin)
- NucleoSpin® Dx Virus: Compatible with fresh or frozen serum and plasma treated with EDTA or citrate

	Mini NucleoSpin® Dx Blood	Mini NucleoSpin® Dx Virus
Technology	Silica membrane technology	Silica membrane technology
Sample material	Whole blood (200 µL)	150 µL plasma/serum
Fragment size	200 bp–approx. 50 kbp	100 bp–approx. 50 kbp
Typical yield	3–5 µg (depending on individual blood sample)	Depending on sample amount and quality
Elution volume	50–200 µL	50 µL
Preparation time	30 min/prep	30 min/6 preps

References

Komlósi et al. 2015 “Phenotypic variability in a Hungarian patient with the 4q21 microdeletion syndrome.”
Molecular Cytogenetics

Ordering information

Product	Preps	REF
NucleoSpin® Dx Blood*	50 / 250	740899.50 / 250
NucleoSpin® Dx Virus*	50	740895.50

* CE-IVD marked kit: not available in all countries, please inquire.

Accessories

HTP equipment	Pack	Specification	REF
NucleoVac 96 Vacuum Manifold	1	For vacuumbased processing. Consists of manifold base and lid, a spacer set and a waste container set. Starter Set A is required when using NucleoSpin® 8-well strips on NucleoVac 96 (see below)	740681
NucleoVac Vacuum Regulator	1	For controlling of vacuum	740641
NucleoMag® SEP	1	Magnetic separator, for use with 96-well plates (e.g., REF 740481) with magnetic bead technology	744900
NucleoMag® 24 SEP	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 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			
96-well format			
MN Wash Plate	4 / 24	To facilitate drying of the DNA / RNA binding module and to minimize the risk of cross-contamination	740479.4 / .24
Square-well Block	4 / 24	For use with NucleoMag® SEP (744900) for magnetic separation	740481.4 / .24
MN Square-well Block	4 / 24	96-well blocks with 2.1 mL square wells for lysis and mixing	740476.4 / .24
Round-well Block	20	96-well blocks with 1.2 mL round wells suitable for mixing steps and collecting elution fractions	740671
Round-well Block with Cap Strips	4 / 24 sets	1 set consists of 1 Round-well Block with 96 1.2 mL round wells and 12 Cap Strips	740475.4 / .24
Round-well Block Low	4	96-well blocks with 0.8 mL round wells	740482
Round-well Block Low	4 / 24 sets	96-well blocks with 0.8 mL round wells and Self-adhering Foil	740487.4 / .24
Elution Plate U-bottom	24	96-well microplates with 300 µL u-bottom wells with Self-adhering Foil	740486.24
Elution Plate Flat-bottom	20	96-well microplates with 370 µL flat-bottom wells	740673
Rack of Tube Strips	5 sets	1 set consists of 1 rack, 12 strips with 8 tubes each	740637
Rack of Tube Strips	4 / 24 sets	1 set consists of 1 rack, 12 strips with 8 tubes each, 12 cap strips	740477.4 / .24
Cap Strips	48 / 488	For sealing of Tube Strips, Round-well Blocks	740478.4 / .24
Gas-permeable Foil	50	To cover square-well blocks during incubation of bacterial cultures	740675
Self-adhering PE-Foil	50	Adhesive tape foils for sealing 96-well elution plates for airtight storage of DNA / RNA	740676
KingFisher® Accessory Kit A	1 set	Square-well Blocks, Deep-well Tip Combs, Elution Plates, for 4 x 96 preps of NucleoMag® Tissue / DNA FFPE / DNA Forensic / Virus / VET using KingFisher® Flex platform	744950
KingFisher® Accessory Kit B	1 set	Deep-well Blocks, Deep-well Tip Combs, Elution Plates, for 4 x 96 preps of NucleoMag® Plant / RNA / Blood 200 ìL using KingFisher® Flex platform	744951
24-well format			
24-Square-well Block U-bottom	4 / 24	24-well blocks with 10 mL U-bottom square wells	740448.4 / .24
KingFisher® Duo Accessory Kit	1 set	Deep-well Plates, Tip Combs and Elution Strips for processing 8 x 12 preps on a KingFisher® Duo Prime platform	744952
KingFisher® Accessory Kit B	1 set	Deep-well Plates and Tip Combs for 5 x 24 preps from NucleoMag® kits in 24-well format on a KingFisher® Flex platform	744953
Single prep equipment			
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			
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

* Not available in USA

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
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® Plasma XS	10/50/250	740900.10/.50/.250
NucleoSpin® DNA Plasma Midi	48	740303.48
NucleoSpin® DNA Plasma Midi Core Kit	48	740302.48
NucleoSpin® 96 DNA Plasma	1 x 96 / 4 x 96	740873.1/.4
NucleoSpin® 96 DNA Plasma Core Kit	1 x 96 / 4 x 96	740874.1/.4
NucleoSnap® DNA Plasma	10/50	740300.10/.50
NucleoMag® DNA Plasma	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® RNA FFPE XS	10/50/250	740969.10/.50/.250
NucleoSpin® RNA FFPE	10/50/250	740982.10/.50/.250
Nucleic acid purification from stool		
NucleoSpin® DNA Stool	10/50	740472.10/.50
NucleoSpin® RNA Stool	10 / 50	740130.10/.50
NucleoZOL	200 mL	740404.200
Nucleic acid purification for in-vitro diagnostics		
NucleoSpin® Dx Blood**	50/250	740899.50/.250
NucleoSpin® Dx Virus**	50	740895.50

** CE-IVD marked kit: not available in all countries, please inquire.

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