Viral RNA and DNA

User manual

NucleoSpin® Virus

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February 2015 / Rev. 02

MACHEREY-NAGEL
www.mn-net.com

Viral RNA and DNA isolation

Protocol-at-a-glance (Rev. 02)

	NucleoSpin® Virus	
	200 µL sample	**400 µL sample**
1 Lyse viruses	5 µL Pro. K 200 µL sample 200 µL VL  Mix 5.6 µL Carrier RNA Mix RT, 3 min Quick spin	10 µL Pro. K 400 µL sample 400 µL VL  Mix 11.2 µL Carrier RNA Mix RT, 3 min Quick spin
2 Adjust binding conditions	 200 µL ethanol Mix RT, 5 min Quick spin	 400 µL ethanol Mix RT, 5 min Quick spin
3 Bind viral RNA/DNA	 Load sample (~ 610 µL)  4,000 x *g*, 3 min	 Load sample stepwise  4,000 x *g*, 3 min
4 Wash and dry silica membrane	 400 µL VW1 400 µL VW2 200 µL VW2 **1st and 2nd wash**  11,000 x *g*, 30 s **3rd wash**  20,000 x *g*, 5 min **dry** 56 °C, 5 min with open lid	 400 µL VW1 400 µL VW2 200 µL VW2  11,000 x *g*, 30 s  20,000 x *g*, 5 min 56 °C, 5 min with open lid
5 Elute RNA/DNA	 30 µL RNase-free H_2O (70 °C) RT, 3 min  20,000 x *g*, 3 min	 30 µL RNase-free H_2O (70 °C) RT, 3 min  20,000 x *g*, 3 min

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Table of contents

1 Components 4

1.1 Kit contents 4

1.2 Reagents, consumables, and equipment to be supplied by user 5

1.3 About this user manual 5

2 Product description 6

2.1 The basic principle 6

2.2 Kit specifications 6

2.3 Remarks regarding sample quality and preparation 7

2.4 Remarks regarding elution 7

2.5 Remarks regarding quality control 8

3 Storage conditions and preparation of working solutions 9

4 Safety instructions 10

5 Protocols 12

5.1 Viral RNA and DNA purification from 200 µL serum, plasma, or cell-free biological fluids 12

5.2 Viral RNA and DNA purification from 400 µL serum, plasma, or cell-free biological fluids 15

6 Appendix 18

6.1 Troubleshooting 18

6.2 Ordering information 19

6.3 Product use restriction/warranty 20

1 Components

1.1 Kit contents

	NucleoSpin® Virus		
	10 preps	**50 preps**	**250 preps**
REF	**740983.10**	**740983.50**	**740983.250**
Lysis Buffer VL	13 mL	25 mL	125 mL
Wash Buffer VW1	6 mL	30 mL	125 mL
Wash Buffer VW2 (Concentrate)*	6 mL	12 mL	50 mL
RNase-free H_2O	13 mL	13 mL	13 mL
Carrier RNA (lyophilized)	300 µg	2 x 300 µg	3 x 1 mg
Liquid Proteinase K	120 µL	600 µL	2 x 1.5 mL
NucleoSpin® Virus Columns (light red rings, plus Collection Tubes)	10	50	250
Collection Tubes (2 mL)	30	150	750
Collection Tubes (1.5 mL) for lysis and elution	20	100	500
User manual	1	1	1

* For preparation of working solutions and storage conditions see section 3.

1.2 Reagents, consumables, and equipment to be supplied by user

Reagents

- 96–100 % ethanol (to prepare Wash Buffer VW2 and to adjust RNA / DNA binding conditions); non-denaturated ethanol is recommended

Consumables

- Disposable pipette tips (aerosol barrier pipette tips are recommended to avoid cross-contamination)

Equipment

- Manual pipettors
- Centrifuge for microcentrifuge tubes
- Vortex mixer
- Heating block for 56 °C incubation
- Personal protection equipment (e.g., lab coat, gloves, goggles)

1.3 About this user manual

It is strongly recommended to read the detailed protocol sections of this user manual if using the **NucleoSpin® Virus** kit for the first time. However, experienced users may refer to the Protocol-at-a-glance. The Protocol-at-a-glance is designed to be used only as a supplemental tool for quick referencing while performing the purification procedure.

All technical literature is available on the internet at ***www.mn-net.com***.

2 Product description

2.1 The basic principle

With the **NucleoSpin® Virus** method, RNA and DNA viruses are lysed quickly and efficiently by Lysis Buffer VL which is a highly concentrated solution of chaotropic ions. DNA viruses (e.g., HBV) are usually more difficult to lyse and require a digestion with Proteinase K which is supplied in the kit. Lysis buffer and ethanol create appropriate binding conditions of nucleic acids to the NucleoSpin® Virus Columns. Carrier RNA improves binding and recovery of low-concentrated viral nucleic acids. Contaminations (potential PCR inhibitors) like salts, metabolites, and soluble macromolecular cellular components are removed in simple wash steps with alcoholic buffers VW1 and VW2. The nucleic acids are eluted in water and are ready-for-use in subsequent reactions.

2.2 Kit specifications

NucleoSpin® Virus kit is designed for the rapid preparation of highly pure viral nucleic acids (e.g., HCV, HIV, CMV) from biological fluids ,such as plasma, and serum. Whole blood samples cannot be used.

- No cross-contamination due to closed systems.
- The **NucleoSpin® Virus** kit is suited to process 200 µL plasma / serum or 400 µL plasma / serum.
- The NucleoSpin® Virus Column allows a small elution volume (30 µL) for highly concentrated viral nucleic acids.
- The prepared nucleic acids are suitable for applications, such as automated fluorescent DNA sequencing, RT-PCR, PCR, or any kind of enzymatic reaction.
- The detection limit of viruses depends on the individual detection procedures, such as, in-house nested (RT-) PCR or qRT-PCR. We highly recommend using standards as well as positive and negative controls to monitor the purification, amplification, and detection processes.
- **Carrier RNA** (poly(-A) RNA: poly(A) potassium salt, prepared from ADP with polynucleotide phosphorylase) is included for optimal performance.
- **Liquid Proteinase K** is included to facilitate adequate lysis of protein in the samples.

Table 1: Kit specifications at a glance	
Parameter	**NucleoSpin® Virus**
Technology	Silica-membrane technology
Format	Mini spin columns
Sample material	200 µL serum, plasma, cell-free biological fluids (400 µL with two loading steps)
Fragment size	approx. 100 bp–50 kb
Elution volume	30 µL
Preparation time	50 min/6 preps

2.3 Remarks regarding sample quality and preparation

Biological fluids or semi-fluid samples, such as plasma and serum, can be processed with NucleoSpin® Virus kit. For successful nucleic acid purification, it is important to obtain a homogeneous, clear, and non-viscous sample before loading onto the NucleoSpin® Virus Columns. Therefore, check all samples (especially old or frozen ones) for precipitates. Avoid clearing samples by centrifugation / filtration before the VL-lysis step, because viruses may be associated with particles or aggregates.

2.4 Remarks regarding elution

- Pure nucleic acids are finally eluted under low ionic strength conditions with RNase-free H_2O.
- Elution can be performed in a single step with water as indicated in the protocol, obtaining at least 80 % of the bound nucleic acids. To improve sensitivity, this eluate can be used in a second elution step increasing the efficiency of elution and concentration of viral nucleic acids slightly. Alternatively, a second elution step can be performed with an additional volume of water releasing practically all bound nucleic acids but resulting in a lower concentrated, combined eluate.
- A high RNA / DNA concentration in the elution fraction is of highest importance and desirable for all typical downstream applications. This is of particular interest if the total volume of a reaction mixture is limited as this in turn limits the possible amount of added DNA / RNA. Due to a high default elution volume, classical RNA / DNA purification kits often result in weakly concentrated RNA / DNA, if only small samples are processed. Such RNA / DNA often even requires a subsequent concentration before it can be used for typical downstream applications.

- In contrast to classical kits, **NucleoSpin® Virus** allows an efficient elution in a small volume which results in highly concentrated RNA / DNA. An elution volume of 30 µL is recommended by default.

2.5 Remarks regarding quality control

In accordance with MACHEREY-NAGEL´s Quality Managment System, each component of **NucleoSpin® Virus** kits is tested against predetermined specifications to ensure consistent product quality.

3 Storage conditions and preparation of working solutions

Attention:

Buffers VL and VW1 contain guanidine salts! Wear gloves and goggles!

- Check all components for damages after receiving the kit. If kit contents like buffer bottles or blisters packages are damaged, contact MACHEREY-NAGEL. Do not use damaged kit components.
- Upon arrival, the NucleoSpin® Virus kit should be stored at room temperature (18–25 °C). It is NOT required to open the kit on delivery and remove individual components for separate storage.
- After first time use, it is recommended to store Liquid Proteinase K at 4 °C or -20 °C.
- Use RNase-free equipment.

Before starting any **NucleoSpin® Virus** protocol, prepare the following:

- **Carrier RNA** (300 µg or 1 mg) is delivered in lyophilized form. Dissolve Carrier RNA in RNase-free water to obtain a stock solution (1 µg/µL). Store Carrier RNA stock solution at -20 °C. Due to the production procedure and the small amount of Carrier RNA contained in the vial, the Carrier RNA may hardly be visible in the vial.
- **Wash Buffer VW2**: Add the indicated volume (see on the bottle or table below) of ethanol (96–100 %; non-denatured ethanol is recommended) to **Wash Buffer VW2 Concentrate**. Mark the label of the bottle to indicate that the ethanol is added. Store **Wash Buffer VW2** at room temperature (18–25 °C).
- **Liquid Proteinase K** is ready to use. After fist time use, store liquid Proteinase K at 4 °C or -20 °C.

	NucleoSpin® Virus		
	10 preps	**50 preps**	**250 preps**
REF	**740983.10**	**740983.50**	**740983.250**
Wash Buffer VW2 (Concentrate)	6 mL Add 24 mL ethanol	12 mL Add 48 mL ethanol to each bottle	50 mL Add 200 mL ethanol
Carrier RNA	300 µg Add 300 µL RNase-free H_20	300 µg Add 300 µL RNase-free H_20	3 x 1 mg Add 1 mL RNase-free H_20 in each vial

4 Safety instructions

The following components of the **NucleoSpin® Virus** kits contain hazardous contents.
Wear gloves and goggles and follow the safety instructions given in this section.

GHS classification

Only harmful features do not need to be labeled with H and P phrases up to 125 mL or 125 g.
Mindergefährliche Eigenschaften müssen bis 125 mL oder 125 g nicht mit H- und P-Sätzen gekennzeichnet werden.

Component *Inhalt*	Hazard contents *Gefahrstoff*	GHS symbol *GHS Symbol*	Hazard phrases *H-Sätze*	Precaution phrases *P-Sätze*
VL	Guanidine hydrochloride 50–66 % *Guanidinhydrochlorid 55–66 %*	 Warning *Achtung*	302, 315, 319	280, 301+312, 302+352, 305+351+338, 330, 332+313, 337+313
VW1	Guanidine hydrochloride 36–50 % + isopropanol 20–50 % *Guanidinhydrochlorid 36–50 % + Isopropanol 20–50 %*	 Warning *Achtung*	226, 302, 319	210, 233, 280, 301+312, 305+351+338, 330, 337+313, 403+235

Hazard phrases

H 226	Flammable liquid and vapour. *Flüssigkeit und Dampf entzündbar.*
H 302	Harmful if swallowed. *Gesundheitsschädlich bei Verschlucken.*
H 315	Causes skin irritation. *Verursacht Hautreizungen.*
H 319	Causes serious eye irritation. *Verursacht schwere Augenreizung.*

Precaution phrases

P 210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. *Von Hitze, heißen Oberflächen, Funken, offenen Flammen sowie anderen Zündquellenarten fernhalten. Nicht rauchen.*
P 233	Keep container tightly closed. *Behälter dicht verschlossen halten.*
P 280	Wear protective gloves / eye protection. *Schutzhandschuhe / Augenschutz tragen.*
P 301+312	IF SWALLOWED: Call a POISON CENTER/ doctor/…/if you feel unwell. *BEI VERSCHLUCKEN: Bei Unwohlsein GIFTINFORMTIONSZENTRUM / Arzt /… anrufen.*

P 302+352	IF ON SKIN: Wash with plenty of water/… *BEI BERÜHRUNG MIT DER HAUT: Mit viel Wasser/… waschen.*
P 305+351+338	IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. *BEI KONTAKT MIT DEN AUGEN: Einige Minuten lang behutsam mit Wasser spülen. Vorhandene Kontaktlinsen nach Möglichkeit entfernen. Weiter ausspülen.*
P 330	Rinse mouth. *Mund ausspülen.*
P 332+313	IF skin irritation occurs: Get medical advice / attention. *Bei Hautreizung: Ärztlichen Rat einholen / ärztliche Hilfe hinzuziehen.*
P 337+313	Get medical advice / attention. *Bei anhaltender Augenreizung: Ärztlichen Rat einholen / ärztliche Hilfe hinzuziehen.*
P403+235	Store in a well ventilated place. Keep cool. *Kühl an einem gut belüfteten Ort aufbewahren.*

For further information please see Material Safety Data Sheets ***(www.mn-net.com).***

Weiterführende Informationen finden Sie in den Sicherheitsdatenblättern ***(www.mn-net.com)****.*

⚠ The symbol shown on labels refers to the precaution phrases of this section.

Das auf Etiketten dargestellte Symbol weist auf die P-Sätzen dieses Kapitels hin.

5 Protocols

5.1 Viral RNA and DNA purification from 200 µL serum, plasma, or cell-free biological fluids

Before starting the preparation:

- Check if Wash Buffer VW2 was prepared according to section 3.
- Check if Carrier RNA is dissolved in water (stock solution).
- The complete procedure should be performed at room temperature (18–25 °C).

1 Lyse viruses

Provide **5 µL Liquid Proteinase K** in a Collection Tube (1.5 mL, provided).

5 µL Proteinase K

Proteinase K may be pipetted into the inside of the lid or onto the side of the inner tube wall. Visually inspect, that the Liquid Proteinase K has been actually deposited into the tube or lid!

Add **200 µL sample** to the tube and mix moderately.

+ 200 µL sample

Add **200 µL Lysis Buffer VL** to the tube.

+ 200 µL VL

Mix the tube content moderately by vortexing (10–15 s).

Mix

If necessary, briefly centrifuge the Collection Tube (**~ 1 s** at **~ 2,000 x *g***) to remove drops from the lid (short spin only).

~ 1 s, ~ 2,000 x *g*

Add **5.6 µL Carrier RNA stock solution** (1 µg/µL) to the tube.

+ 5.6 µL Carrier RNA

Mix the tube content by vortexing or pipetting up and down.

Mix

Incubate for **3 min** at **room temperature**.

RT, 3 min

If neccesary, briefly centrifuge the Collection Tube (**~ 1 s** at **~ 2,000 x *g***) to remove drops from the lid (short spin only).

~ 1 s, ~ 2,000 x *g*

2 Adjust binding conditions

Add **200 µL ethanol** (96–100 %) to the tube and mix by vortexing (10–15 s).

+ 200 µL EtOH

Incubate for **5 min** at **room temperature (18–25 °C).**

RT, 5 min

Briefly centrifuge the Collection Tube (**~ 1 s** at **~ 2,000 x *g***) to remove drops from the lid (short spin only).

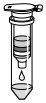
Do not centrifuge at a higher g-force in this step!

~ 1 s,
~ 2,000 x *g*

3 Bind viral RNA / DNA

Load the lysate (610 µL) onto a NucleoSpin® Virus Column and centrifuge **3 min** at **4,000 x *g***.

If the lysate is not completely drawn through the membrane, repeat the centrifugation at higher g-forces (15,000–20,800 x g for 1 min). In case the lysate still does not pass the membrane completely, discard the sample and repeat the isolation with new sample material.



Load sample

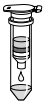
3 min,
4,000 x *g*

Place the NucleoSpin® Virus Column into a new Collection Tube (2 mL, provided) and discard the Collection Tube with flow-through from the previous step.

4 Wash and dry silica membrane

1st wash

Add **400 µL Wash Buffer VW1** to the NucleoSpin® Virus Column.



+ 400 µL VW1

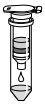
Centrifuge **30 s** at **11,000 x *g***.

30 s,
11,000 x *g*

Place the NucleoSpin® Virus Column into a new Collection Tube (2 mL, provided) and discard the Collection Tube with flow-through from the previous step.

2nd wash

Add **400 µL Wash Buffer VW2** to the NucleoSpin® Virus Column.



+ 400 µL VW2

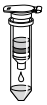
Centrifuge **30 s** at **11,000 x *g***.

30 s,
11,000 x *g*

Place the NucleoSpin® Virus Column into a new Collection Tube (2 mL, provided) and discard the Collection Tube with flow-through from the previous step.

Note: Make sure that residual buffer from the previous step is washed away with Buffer VW2, especially if the lysate has been in contact with the inner rim of the column during loading of the lysate onto the column. For efficient washing of the inner rim, flush it with Buffer VW2.

3rd wash



+ 200 µL VW2

Add **200 µL Wash Buffer VW2** to the NucleoSpin® Virus Column.

Centrifuge for **5 min** at **20,000 x *g*** (or full speed).

5 min, 20,000 x *g*

Place the NucleoSpin® Virus Column in a clean Elution Tube (1.5 mL, provided) and discard the Collection Tube with flow-through from the previous step.

Incubate the assembly for **5 min** at **56 °C** with open column lid.

56 °C, 5 min

5 Elute RNA / DNA

+ 30 µL RNase-free H_2O (70 °C)

Add **30 µL RNase-free H_2O** (pre-heated to 70 °C) onto the column.

Incubate for **3 min** at **room temperature**.

RT, 3 min

Centrifuge **3 min** at **20,000 x *g*** to elute nucleic acid from the column.

3 min, 20,000 x *g*

Keep eluted RNA / DNA on ice or freeze for storage.

5.2 Viral RNA and DNA purification from 400 µL serum, plasma, or cell-free biological fluids

Before starting the preparation:

- Check if Wash Buffer VW2 was prepared according to section 3.
- Check if Carrier RNA is dissolved in water (stock solution).
- The complete procedure should be performed at room temperature (18–25 °C).

1 Lyse viruses

Provide **10 µL Liquid Proteinase K** in a Collection Tube (1.5 mL, provided).

10 µL Proteinase K

Proteinase K may be pipetted into the inside of the lid or onto the side of the inner tube wall. Visually inspect, that the Liquid Proteinase K has been actually deposited into the tube or lid!

Add **400 µL sample** to the tube and mix moderately. **+ 400 µL sample**

Add **400 µL Lysis Buffer VL**. **+ 400 µL VL**

Mix the tube content moderately by vortexing (10–15 s). **Mix**

If necessary, briefly centrifuge the Collection Tube (**~ 1 s** at **~ 2,000 x *g***) to remove drops from the lid (short spin only).

~ 1 s, ~ 2,000 x *g*

Add **11.2 µL Carrier RNA stock solution** (1 µg/µL) to the tube. **+ 11.2 µL Carrier RNA**

<u>Note</u>: *Alternatively, 5.6 µg Carrier RNA can be used. Influence of Carrier RNA amount on downstream applications is typically low, but might vary between different downstream applications.*

Mix the tube content by vortexing or pipetting up and down. **Mix**

Incubate for **3 min** at **room temperature**. **RT, 3 min**

If necessary, briefly centrifuge the Collection Tube (**~ 1 s** at **~ 2,000 x *g***) to remove drops from the lid (short spin only).

~ 1 s, ~ 2,000 x *g*

2 Adjust binding conditions

Add **400 µL ethanol** (96–100 %) to the tube and mix by vortexing (10–15 s).

+ 400 µL EtOH

Incubate for **5 min** at **room temperature (18–25 °C).**

RT, 5 min

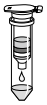
Briefly centrifuge the Collection Tube (**~ 1 s** at **~ 2,000 x *g***) to remove drops from the lid (short spin only).

~ 1 s, ~ 2,000 x *g*

3 Bind viral RNA / DNA

Load 600 µL lysate onto a NucleoSpin® Virus Column and centrifuge **3 min** at **4,000 x *g***.

Place the NucleoSpin® Virus Column into a new Collection Tube (2 mL, provided) and discard the Collection Tube with flow-through from the previous step.



Load sample stepwise

Load the remaining lysate onto the NucleoSpin® Virus Column and centrifuge **3 min** at **4,000 x *g***.

Place the NucleoSpin® Virus Column into a new Collection Tube (2 mL, not provided) and discard the Collection Tube with flow-through from the previous step.

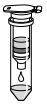
3 min, 4,000 x *g*

If the lysate is not completely drawn through the membrane, repeat the centrifugation at higher g-forces (15,000–20,800 x g for 1 min). In case the lysate still does not pass the membrane completely, discard the sample and repeat the isolation with new sample material.

4 Wash and dry silica membrane

1st wash

Add **400 µL Wash Buffer VW1** to the NucleoSpin® Virus Column.



+ 400 µL VW1

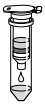
Centrifuge **30 s** at **11,000 x *g***.

30 s, 11,000 x *g*

Place the NucleoSpin® Virus Column into a new Collection Tube (2 mL, provided) and discard the Collection Tube with flow-through from the previous step.

2nd wash

Add **400 µL Wash Buffer VW2** to the NucleoSpin® Virus Column.



+ 400 µL VW2

Centrifuge **30 s** at **11,000 x *g***.

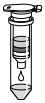
30 s, 11,000 x *g*

Place the NucleoSpin® Virus Column into a new Collection Tube (2 mL, provided) and discard the Collection Tube with flow-through from the previous step.

Note: Make sure that residual buffer from the previous step is washed away with Buffer VW2, especially if the lysate has been in contact with the inner rim of the column during loading of the lysate onto the column. For efficient washing of the inner rim, flush it with Buffer VW2.

3rd wash

Add **200 µL Wash Buffer VW2** to the NucleoSpin® Virus Column.



+ 200 µL VW2

Centrifuge for **5 min** at **20,000 x *g***.

Place the NucleoSpin® Virus Column in a clean Elution Tube (1.5 mL, provided) and discard the Collection Tube with flow-through from the previous step.

5 min, 20,000 x *g*

Incubate the assembly for **5 min** at **56 °C** with open column lid.

56 °C, 5 min

5 Elute RNA / DNA

Add **30 µL RNase-free H_2O** (pre-heated to 70 °C) onto the column.

+ 30 µL RNase-free H_2O (70 °C)

Incubate for **3 min** at **room temperature**.

RT, 3 min

Centrifuge **3 min** at **20,000 x *g*** to elute nucleic acid from the column.

3 min, 20,000 x *g*

Keep eluted RNA / DNA on ice or freeze for storage.

6 Appendix

6.1 Troubleshooting

Problem	Possible cause and suggestions
Small amounts or no viral nucleic acids in the eluate	*Problems with Carrier RNA* • Carrier RNA was not added. *Viral nucleic acids degraded* • Samples should be processed immediately. Ensure appropriate storage conditions up to the processing. • Check that all buffers have been prepared and stored correctly. If in doubt, use new aliquots of Buffer VL, Carrier RNA, and RNase-free water.
Problems with subsequent detection	*Reduced sensitivity* • Change the volume of eluate added to the PCR / RT-PCR. *Ethanol carry-over* • Prolong centrifugation steps in order to remove Buffer VW2 completely. *Carrier RNA interference with detection method* • Check if Carrier RNA interferes the detection method. Some detection methods tolerate only limited amounts of carrier RNA.
General problems	*Clogged membrane* • Centrifuge plasma lysate before the addition of ethanol and subsequent loading onto the corresponding NucleoSpin® Virus Columns.

6.2 Ordering information

Product	REF	Pack of
NucleoSpin® Virus	740983.10 / .50 / .250	10 / 50 / 250
NucleoSpin® Dx Virus	740895.50	50
NucleoSpin® RNA Virus F	740958	25
NucleoSpin® Funnel Columns	740959	30 sets
NucleoSpin® 8 Virus	740643 / .5	12 x 8 / 60 x 8
NucleoSpin® 96 Virus	740691.2 / .4	2 x 96 / 4 x 96
NucleoMag® 96 Virus	744800.1 / .4	1 x 96 / 4 x 96
NucleoSpin® Blood	740951.10 / .50 / .250	10 / 50 / 250
NucleoSpin® Tissue	740952.10 / .50 / .250	10 / 50 / 250
NucleoSpin® RNA	740955.10 / .50 / .250	10 / 50 / 250
NucleoSpin® RNA Blood	740200.10 / .50	10 / 50
NucleoSpin® RNA Blood Midi	740210.20	20
Collection Tubes (2 mL)	740600	1000

Visit ***www.mn-net.com*** for more detailed product information.

6.3 Product use restriction/warranty

NucleoSpin® Virus kit components are intended, developed, designed, and sold FOR RESEARCH PURPOSES ONLY, except, however, any other function of the product being expressly described in original MACHEREY-NAGEL product leaflets.

MACHEREY-NAGEL products are intended for GENERAL LABORATORY USE ONLY! MACHEREY-NAGEL products are suited for QUALIFIED PERSONNEL ONLY! MACHEREY-NAGEL products shall in any event only be used wearing adequate PROTECTIVE CLOTHING. For detailed information please refer to the respective Material Safety Data Sheet of the product! MACHEREY-NAGEL products shall exclusively be used in an ADEQUATE TEST ENVIRONMENT. MACHEREY-NAGEL does not assume any responsibility for damages due to improper application of our products in other fields of application. Application on the human body is STRICTLY FORBIDDEN. The respective user is liable for any and all damages resulting from such application.

DNA/RNA/PROTEIN purification products of MACHEREY-NAGEL are suitable for *IN VITRO*-USES ONLY!

ONLY MACHEREY-NAGEL products specially labeled as IVD are also suitable for *IN VITRO*-diagnostic use. Please pay attention to the package of the product. *IN VITRO*-diagnostic products are expressly marked as IVD on the packaging.

IF THERE IS NO IVD SIGN, THE PRODUCT SHALL NOT BE SUITABLE FOR *IN VITRO*-DIAGNOSTIC USE!

ALL OTHER PRODUCTS NOT LABELED AS IVD ARE NOT SUITED FOR ANY CLINICAL USE (INCLUDING, BUT NOT LIMITED TO DIAGNOSTIC, THERAPEUTIC AND/OR PROGNOSTIC USE).

No claim or representations is intended for its use to identify any specific organism or for clinical use (included, but not limited to diagnostic, prognostic, therapeutic, or blood banking). It is rather in the responsibility of the user or - in any case of resale of the products - in the responsibility of the reseller to inspect and assure the use of the DNA/RNA/protein purification products of MACHEREY-NAGEL for a well-defined and specific application.

MACHEREY-NAGEL shall only be responsible for the product specifications and the performance range of MN products according to the specifications of in-house quality control, product documentation and marketing material.

This MACHEREY-NAGEL product is shipped with documentation stating specifications and other technical information. MACHEREY-NAGEL warrants to meet the stated specifications. MACHEREY-NAGEL´s sole obligation and the customer´s sole remedy is limited to replacement of products free of charge in the event products fail to perform as warranted. Supplementary reference is made to the general business terms and conditions of MACHEREY-NAGEL, which are printed on the price list. Please contact us if you wish to get an extra copy.

There is no warranty for and MACHEREY-NAGEL is not liable for damages or defects arising in shipping and handling (transport insurance for customers excluded), or out of accident or improper or abnormal use of this product; defects in products or

components not manufactured by MACHEREY-NAGEL, or damages resulting from such non-MACHEREY-NAGEL components or products.

MACHEREY-NAGEL makes no other warranty of any kind whatsoever, and SPECIFICALLY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES OF ANY KIND OR NATURE WHATSOEVER, DIRECTLY OR INDIRECTLY, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, AS TO THE SUITABILITY, REPRODUCTIVITY, DURABILITY, FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, CONDITION, OR ANY OTHER MATTER WITH RESPECT TO MACHEREY-NAGEL PRODUCTS.

In no event shall MACHEREY-NAGEL be liable for claims for any other damages, whether direct, indirect, incidental, compensatory, foreseeable, consequential, or special (including but not limited to loss of use, revenue or profit), whether based upon warranty, contract, tort (including negligence) or strict liability arising in connection with the sale or the failure of MACHEREY-NAGEL products to perform in accordance with the stated specifications. This warranty is exclusive and MACHEREY-NAGEL makes no other warranty expressed or implied.

The warranty provided herein and the data, specifications and descriptions of this MACHEREY-NAGEL product appearing in MACHEREY-NAGEL published catalogues and product literature are MACHEREY-NAGEL´s sole representations concerning the product and warranty. No other statements or representations, written or oral, by MACHEREY-NAGEL´s employees, agent or representatives, except written statements signed by a duly authorized officer of MACHEREY-NAGEL are authorized; they should not be relied upon by the customer and are not a part of the contract of sale or of this warranty.

Product claims are subject to change. Therefore please contact our Technical Service Team for the most up-to-date information on MACHEREY-NAGEL products. You may also contact your local distributor for general scientific information. Applications mentioned in MACHEREY-NAGEL literature are provided for informational purposes only. MACHEREY-NAGEL does not warrant that all applications have been tested in MACHEREY-NAGEL laboratories using MACHEREY-NAGEL products. MACHEREY-NAGEL does not warrant the correctness of any of those applications.

Last updated: 07/2010, Rev. 03

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