

RNA clean-up

User manual

NucleoSpin[®] RNA Clean-up XS

**This product distributed by Clontech Laboratories, Inc.
A Takara Bio Company**

1290 Terra Bella Ave., Mountain View, CA 94043
www.clontech.com

For ordering information

1.800.662.2566
orders@clontech.com

For technical support

1.800.662.2566
tech@clontech.com



For research use only. Not for resale. Unless otherwise indicated, all trademarks are the property of Clontech Laboratories, Inc. ©2015

May 2014 / Rev. 03

MACHEREY-NAGEL

www.mn-net.com



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 | Handling, preparation, and storage of starting materials | 7 |
| 2.4 | Elution procedures | 8 |
| 2.5 | Stability of isolated RNA | 8 |
| 3 | Storage conditions and preparation of working solutions | 9 |
| 4 | Safety instructions | 10 |
| 5 | Protocols | 11 |
| 5.1 | RNA clean-up and concentration of RNA | 11 |
| 5.2 | DNA digestion in crude RNA extracts and subsequent clean-up | 13 |
| 6 | Appendix | 14 |
| 6.1 | Troubleshooting | 14 |
| 6.2 | Ordering information | 16 |
| 6.3 | Literature | 17 |
| 6.4 | Product use restriction/warranty | 17 |

1 Components

1.1 Kit contents

| NucleoSpin® RNA Clean-up XS | | | |
|--|-----------------------|-----------------------|-------------------------|
| REF | 10 preps 740903.10 | 50 preps 740903.50 | 250 preps 740903.250 |
| Clean-up Buffer RCU (Concentrate)* | 5 mL | 5 mL | 5 x 5 mL |
| Wash Buffer RA3 (Concentrate)* | 6 mL | 12 mL | 50 mL |
| RNase-free H ₂ O | 13 mL | 13 mL | 13 mL |
| NucleoSpin® RNA Clean-up XS Binding Columns (light blue rings – plus Collection Tubes) | 10 | 50 | 250 |
| Collection Tubes (2 mL) | 10 | 50 | 250 |
| Collection Tubes (1.5 mL) | 10 | 50 | 250 |
| 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 RA3 and to adjust RNA binding conditions)

Consumables

- 1.5 mL microcentrifuge tubes
- Sterile RNase-free tips

Equipment

- Manual pipettors
- Vortex mixer
- Centrifuge for microcentrifuge tubes
- Personal protection equipment (e.g., lab coat, gloves, goggles)

1.3 About this user manual

It is strongly recommended reading the detailed protocol sections of this user manual if the **NucleoSpin® RNA Clean-up XS** kit is used for the first time. Experienced users, however, may refer to the Protocol-at-a-glance instead. 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**.

Please contact Technical Service regarding information about changes of the current user manual compared to previous revisions.

2 Product description

2.1 The basic principle

A major aspect of RNA clean-up is preventing degradation of the RNA during the clean-up procedure. The **NucleoSpin® RNA Clean-up XS** method achieves this by mixing the crude RNA extract with a binding buffer, containing chaotropic ions, and ethanol. This buffer immediately inactivates RNases (which are present in virtually all biological materials) and creates appropriate binding conditions to allow adsorption of RNA to the silica membrane. Two washing steps with a single buffer remove any impurities. Pure RNA is finally eluted at low ionic strength conditions with RNase-free water (supplied) in a volume as small as 5 µL.

The RNA clean-up procedure using **NucleoSpin® RNA Clean-up XS** kit can be performed at room temperature. The eluate should be treated with care because RNA is very sensitive to trace contaminations of RNases, often present on general lab ware, fingerprints, and dust. To ensure RNA stability, we recommend keeping the RNA solution frozen at -20 °C for short-term or -70 °C for long-term storage.

2.2 Kit specifications

- The **NucleoSpin® RNA Clean-up XS** kit is recommended for the clean-up and concentration of prepurified RNA samples. Typical sample material covers nanogram to microgram amounts of prepurified RNA (e.g., phenol-purified RNA) and RNA from reaction mixtures (e.g., DNase treated samples).
- The innovative column design with a funnel shaped thrust ring and a small silica membrane area allows sample volumes of up to 300 µL and elution of RNA in as little as 5–30 µL. Thus, **highly concentrated RNA** is eluted and is ready for common downstream applications (e.g., RT-PCR). RNA enrichment of 20x up to 50x can be achieved (e.g., input: 300 µL sample containing crude RNA (10 ng/µL); output: 5 µL eluate containing pure RNA (510 ng/µL); enrichment of factor 51 (MACHEREY-NAGEL in-house data)).
- The **RNA recovery rate** is typically 85–95 %.
- High quality RNA (RNA Integrity Number (RIN) > 9 according to Agilent 2100 Bioanalyzer assays) can be obtained from high quality RNA samples. The RIN of the processed sample is typically equal (±0.3) to the RIN of the input sample. RNA quality always depends on the sample quality, see section 6.3 for further aspects.
- The **NucleoSpin® RNA Clean-up XS** kit allows clean-up and concentration of RNA with an A_{260}/A_{280} ratio generally exceeding 1.9 (measured in TE buffer pH 7.5). Due to the **high RNA purity**, large amounts of eluates can be used as template in RT-PCR without inhibition (e. g., 8 µL of 10 µL eluates as template in a 20 µL qRT-PCR setup generating stronger signal compared to reactions

with less template in a LightCycler™ PCR with the Sigma SYBR® Green Quantitative RT-PCR Kit).

Table 1: Kit specifications at a glance

| Parameter | NucleoSpin® RNA Clean-up XS |
|-------------------|--|
| Technology | Silica-membrane technology |
| Format | Mini spin columns – XS design |
| Sample material | < 300 µL RNA solution containing < 90 µg RNA |
| Fragment size | > 200 nt |
| Typical recovery | 85–95 % |
| A_{260}/A_{280} | 1.9–2.1 |
| Elution volume | 5–30 µL |
| Preparation time | Approx. 20 min/6 preps |
| Binding capacity | 110 µg |

2.3 Handling, preparation, and storage of starting materials

RNA intended to be used as sample for the **NucleoSpin® RNA Clean-up XS** procedure should be handled with the same care as any RNA sample. The stability of prepurified RNA samples (e.g., RNA isolated with phenol based protocols) depends very much on the performed procedure.

Wear gloves at all times during the preparation. Change gloves frequently.

2.4 Elution procedures

A high RNA concentration in the elution fraction is desirable for all typical downstream applications. In particular with regard to limited volumes of reaction mixes, high RNA concentration can be a crucial criterion. Due to a high default elution volume, standard kits often result in low concentrated RNA, if only small samples are processed.

Such RNA often even requires a subsequent concentration to be suitable for the desired application.

In contrast to standard kits, **NucleoSpin® RNA Clean-up XS** allows an efficient elution in a very small volume resulting in highly concentrated RNA.

Elution volumes in the range of 5–30 µL are recommended, the default volume is 10 µL.

2.5 Stability of isolated RNA

Eluted RNA should immediately be put and always kept on ice during work for optimal stability! Contamination with almost omnipresent RNases (general lab ware, fingerprints, dust) may be a risk for isolated RNA. For short-term storage freeze at -20 °C, for long-term storage freeze at -70 °C.

3 Storage conditions and preparation of working solutions

Attention: Buffers RCU contains chaotropic salt. Wear gloves and goggles!

CAUTION: Buffer RCU contains guanidinium thiocyanate which can form highly reactive compounds when combined with bleach (sodium hypochlorite). DO NOT add bleach or acidic solutions directly to the sample-preparation waste.

- All kit components should be stored at room temperature (18–25 °C) and are stable up to one year. Storage at lower temperatures may cause precipitation of salts.
- Check that 96–100 % ethanol is available as additional solution in the lab.

Before starting any **NucleoSpin® RNA Clean-up** protocol, prepare the following:

- **Clean-up Buffer RCU:** Add the indicated volume of 96–100 % ethanol to the Clean-up Buffer RCU Concentrate. See table below or bottle label for necessary volumes. Store Buffer RCU at room temperature (18–25 °C) for up to one year.
- **Wash Buffer RA3:** Add the indicated volume of 96–100 % ethanol (see table below) to Wash Buffer RA3 Concentrate. Mark the label of the bottle to indicate that ethanol was added. Store Wash Buffer RA3 at room temperature (18–25 °C) for up to one year.

| NucleoSpin® RNA Clean-up | | | |
|-----------------------------------|---------------------------|----------------------------|--|
| REF | 10 preps 740903.10 | 50 preps 740903.50 | 250 preps 740903.250 |
| Clean-up Buffer RCU (Concentrate) | 5 mL Add 15 mL ethanol | 5 mL Add 15 mL ethanol | 5 x 5 mL Add 15 mL ethanol to each bottle |
| Wash Buffer RA3 (Concentrate) | 6 mL Add 24 mL ethanol | 12 mL Add 48 mL ethanol | 50 mL Add 200 mL ethanol |

4 Safety instructions


The following components of the **NucleoSpin® RNA Clean-up XS** 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 | Hazard contents | GHS symbol | Hazard phrases | Precaution phrases |
|---------------|---|---|---------------------|---------------------------|
| <i>Inhalt</i> | <i>Gefahrstoff</i> | <i>GHS Symbol</i> | <i>H-Sätze</i> | <i>P-Sätze</i> |
| RCU | Guanidinium thiocyanate 30–60 % <i>Guanidiniumthiocyanat</i> 30–60 % |  Warning Achtung | 302, 412, EUH031 | 260, 273, 301+312, 330 |

Hazard phrases

| | |
|--------|---|
| H 302 | Harmful if swallowed. <i>Gesundheitsschädlich bei Verschlucken.</i> |
| H 412 | Harmful to aquatic life with long lasting effects. <i>Schädlich für Wasserorganismen, mit langfristiger Wirkung.</i> |
| EUH031 | Contact with acids liberates toxic gas. <i>Entwickelt bei Berührung mit Säure giftige Gase.</i> |

Precaution phrases

| | |
|-----------|---|
| P 260 | Do not breathe vapours. <i>Dampf nicht einatmen.</i> |
| P 273 | Avoid release to the environment. <i>Freisetzung in die Umwelt vermeiden.</i> |
| P 301+312 | IF SWALLOWED: Call a POISON CENTER/ doctor/...if you feel unwell. <i>BEI VERSCHLUCKEN: Bei Unwohlsein GIFTINFORMATIONSZENTRUM / Arzt /... anrufen.</i> |
| P 330 | Rinse mouth. <i>Mund ausspülen.</i> <i>Bei Symptomen der Atemwege: GIFTINFORMATIONSZENTRUM oder Arzt anrufen.</i> |

For further information please see Material Safety Data Sheets (www.mn-net.com).
Weiterführende Informationen finden Sie in den Sicherheitsdatenblättern (www.mn-net.com).

* Hazard labeling not necessary if quantity per bottle below 125 g or ml (certificate of exemption according to 67/548/EEC Art. 25, 1999/45/EC Art. 12 and German GefStoffV § 20 (3) and TRGS 200 7.1). For further information see Material Safety Data Sheet.

5 Protocols

5.1 RNA clean-up and concentration of RNA

Before starting the preparation:

- Check if Buffer RCU and Buffer RA3 were prepared according to section 3.

1 Sample preparation

Provide up to **300 µL sample** containing up to 90 µg RNA – such as prepurified RNA (e.g., phenol purified) or RNA from reaction mixtures (e.g., labelling reactions) – in a microcentrifuge tube (not provided).



For appropriate sample amounts see section 2.3.

Note: Fill up RNA samples smaller than 100 µL with RNase-free water to 100 µL. RNA samples from 100–200 µL should be filled up with RNase-free water to 200 µL.

2 Adjust RNA binding conditions

Add **one volume of Buffer RCU** to the sample (e.g., 100 µL RCU to 100 µL sample) and **mix 2 x 5 s**. If necessary, spin down gently (approx. 1 s at 1,000 x g) to clean the lid.



+ 1 vol. RCU

**Mix
(2 x 5 s)**

3 Bind RNA

Take one NucleoSpin® RNA XS Column (light blue ring) placed in a Collection Tube for each preparation. Load up to **300 µL sample mix** to the column. Centrifuge for **30 s** at **11,000 x g**.

For volumes exceeding 300 µL, load the sample mix in two subsequent centrifugation steps onto the column.

Place the column in a new Collection Tube (2 mL).



**Load sample
mix**



**11,000 x g,
30 s**

Maximal loading capacity of NucleoSpin® RNA XS Columns is 600 µL. However, for maximum performance loading at most 300 µL onto the column for one centrifugation step is recommended. For larger volumes, load the sample mix in two (or more if necessary) successive centrifugation steps. Repeat the procedure if larger volumes are to be processed. For high demanding applications, the recovery rate can further be increased as follows: Centrifuge 30 s at 2,000 x g prior to centrifugation for 30 s at 11,000 x g.

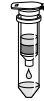
4 Wash and dry silica membrane

1st wash

Add **400 µL Buffer RA3** to the NucleoSpin® RNA XS Column. Centrifuge for **30 s** at **11,000 x g**. Discard flow-through and place the column back into the Collection Tube.

+ 400 µL RA3

**11,000 x g,
30 s**



2nd wash

Add **200 µL Buffer RA3** to the NucleoSpin® RNA XS Column. Centrifuge for **2 min** at **11,000 x g** to dry the membrane. Place the column into a nuclease-free Collection Tube (1.5 mL, supplied).

+ 200 µL RA3

**11,000 x g,
2 min**

If for any reason, the liquid level in the Collection Tube has reached the NucleoSpin® RNA XS Column after centrifugation, discard flow-through and centrifuge again.

5 Elute RNA

Elute the RNA in **10 µL RNase-free H₂O**, (supplied) and centrifuge at **11,000 x g** for **30 s**.

If higher RNA concentrations or higher elution volumes are desired, elution volume may be varied in the range of 5–30 µL.

For further details on alternative elution procedures see section 2.4.



**+ 10 µL
RNase-free
H₂O**

**11,000 x g,
30 s**



5.2 DNA digestion in crude RNA extracts and subsequent clean-up

Several commonly used RNA purification methods co-purify DNA to a considerable extent (e.g., phenol based RNA purification). This often requires a subsequent removal of contaminating DNA and clean-up of the RNA from the reaction mixture.

DNA digestion in solution can efficiently destroy contaminating DNA. However, stringent RNase control and subsequent repurification of the RNA (in order to remove buffer, salts, DNase, and digested DNA) are usually required.

The MACHEREY-NAGEL rDNase Set (to be ordered separately, see ordering information), contains high quality, recombinant RNase-free DNase (rDNase) and reaction buffer. It is optimized for a highly efficient digestion in order to remove even traces of contaminating DNA.

1 Digest DNA (reaction setup)

Prepare enzyme-buffer premix: Add **1 µL rDNase** to **10 µL Reaction Buffer for rDNase**.

Add 1/10 volume of enzyme-buffer premix to the crude RNA extract (e.g., to 10 µL RNA extract add 1 µL of the premix comprising buffer and enzyme).

Gently swirl the tube in order to mix the solutions. Spin down gently (approx. 1 s at 1,000 x g) to collect every droplet of the solution at the bottom of the tube.

Note: Dissolve lyophilized rDNase (rDNase Set, see ordering information) in 540 µL RNase-free H₂O as described in the corresponding user manual.

2 Incubate sample

Incubate for **10 min** at **37 °C**.

3 Repurify RNA

Repurify RNA with the NucleoSpin® RNA Clean-up XS kit according to section 5.1.

6 Appendix

6.1 Troubleshooting

| Problem | Possible cause and suggestions |
|---------------------------------|---|
| RNA is degraded/no RNA obtained | <p data-bbox="333 344 549 367"><i>RNase contamination</i></p> <ul data-bbox="333 379 981 536" style="list-style-type: none"> • Create an RNase-free working environment. Wear gloves during all steps of the procedure. Change gloves frequently. Use of sterile, disposable polypropylene tubes is recommended. Keep tubes closed whenever possible during the preparation. Glassware should be oven-baked for at least 2 hours at 250 °C before use. |
| Poor RNA quality or yield | <p data-bbox="333 576 751 598"><i>Reagents not applied or restored properly</i></p> <ul data-bbox="333 611 981 783" style="list-style-type: none"> • Sample and reagents have not been mixed completely. Always vortex vigorously after each reagent has been added. • No ethanol has been added to Clean-up Buffer RCU. Binding of RNA to the silica membrane is only effective in the presence of ethanol. Adjust binding conditions by adding ethanol to Clean-up Buffer RCU Concentrate as described in section 3. <p data-bbox="333 823 443 845"><i>Kit storage</i></p> <ul data-bbox="333 858 981 975" style="list-style-type: none"> • Store kit components at room temperature. Storage at low temperatures may cause salt precipitation. • Keep bottles tightly closed in order to prevent evaporation or contamination. <p data-bbox="333 1015 981 1070"><i>Ionic strength and pH influence A_{260} absorption as well as ratio A_{260}/A_{280}</i></p> <ul data-bbox="333 1083 981 1294" style="list-style-type: none"> • For adsorption measurement, use 5 mM Tris pH 8.5 as diluent. Please see also: <ul data-bbox="367 1134 981 1294" style="list-style-type: none"> - Manchester, K L. 1995. Value of A_{260}/A_{280} ratios for measurement of purity of nucleic acids. <i>Biotechniques</i> 19, 208–209. - Wilfinger, W W, Mackey, K and Chomczynski, P. 1997. Effect of pH and ionic strength on the spectrophotometric assessment of nucleic acid purity. <i>Biotechniques</i> 22, 474–481. <p data-bbox="333 1334 499 1356"><i>Sample material</i></p> <ul data-bbox="333 1369 981 1422" style="list-style-type: none"> • Sample material not stored properly. Keep thawed samples on ice before addition of Buffer RCU. |

| Problem | Possible cause and suggestions |
|---|--|
| Contamination of RNA with genomic DNA | <p><i>Sample material already contaminated with DNA</i></p> <ul style="list-style-type: none">• Digest contaminating DNA in an RNA sample according to section 5.2. |
| Suboptimal performance of RNA in downstream experiments | <p><i>Carry-over of ethanol or salt</i></p> <ul style="list-style-type: none">• Do not let the flow-through touch the column outlet after the second wash using Wash Buffer RA3. Be sure to centrifuge at the corresponding speed for the respective time in order to remove ethanolic Wash Buffer RA3 completely.• Check if Wash Buffer RA3 has been equilibrated to room temperature before use. Washing at lower temperatures lowers efficiency of salt removal by Wash Buffer RA3.• Depending on the robustness of the used RT-PCR system, RT-PCR might be inhibited if complete eluates are used as template for RT-PCR. Use less eluate as template. <p><i>Store isolated RNA properly</i></p> <ul style="list-style-type: none">• Eluted RNA should always be kept on ice for optimal stability since trace contaminations of omnipresent RNases (general lab ware, fingerprints, dust) will degrade the isolated RNA. For short term storage freeze at -20 °C, for long term storage freeze at -70 °C. |
| Higher RNA yield than theoretically possible | <ul style="list-style-type: none">• If performing clean-up of samples containing less than approximately 300 ng RNA, subsequent quantification by A_{260} measurement may simulate yields larger than the RNA input. This may be due to absorbance of silica abrasion. In order to prevent incorrect A_{260} quantification of small RNA amounts, centrifuge the elution tube for 30 s at 8.000–11.000 x <i>g</i> and withdraw an aliquot for measurement without disturbing any sediment or use a silica abrasion insensitive RNA quantification method (e.g., RiboGreen fluorescent dye). |
| Unexpected A_{260}/A_{280} ratio | <p><i>Measurement not in the range of photometer detection limit</i></p> <ul style="list-style-type: none">• In order to obtain a significant A_{260}/A_{280} ratio it is necessary that the initially measured A_{260} and A_{280} values are significantly above the detection limit of the photometer used. An A_{280} value close to the background noise of the photometer will cause unexpected A_{260}/A_{280} ratios. |

6.2 Ordering information

| Product | REF | Pack of |
|---------------------------------|------------|------------------------|
| NucleoSpin® RNA Clean-up XS | 740903.10 | 10 preps |
| | 740903.50 | 50 preps |
| | 740903.250 | 250 preps |
| NucleoSpin® RNA XS | 740902.10 | 10 preps |
| | 740902.50 | 50 preps |
| | 740902.250 | 250 preps |
| NucleoSpin® RNA | 740955.20 | 20 preps |
| | 740955.50 | 50 preps |
| | 740955.250 | 250 preps |
| NucleoSpin® RNA Midi | 740962.20 | 20 preps |
| NucleoSpin® RNA/Protein | 740933.10 | 10 preps |
| | 740933.50 | 50 preps |
| | 740933.250 | 250 preps |
| NucleoSpin® TriPrep* | 740966.10 | 10 preps |
| | 740966.50 | 50 preps |
| | 740966.250 | 250 preps |
| NucleoSpin® RNA Clean-up | 740948.10 | 10 preps |
| | 740948.50 | 50 preps |
| | 740948.250 | 250 preps |
| NucleoSpin® miRNA | 740971.10 | 10 preps |
| | 740971.50 | 50 preps |
| | 740971.250 | 250 preps |
| NucleoSpin® RNA Blood | 740200.10 | 10 preps |
| | 740200.50 | 50 preps |
| NucleoSpin® RNA Plant | 740949.10 | 10 preps |
| | 740949.50 | 50 preps |
| | 740949.250 | 250 preps |
| NucleoSpin® FFPE RNA | 740969.10 | 10 preps |
| | 740969.50 | 50 preps |
| | 740969.250 | 250 preps |
| NucleoSpin® RNA/DNA Buffer Set* | 740944 | Suitable for 100 preps |

* DISTRIBUTION AND USE OF NUCLEOSPIN® TRIPREP and NUCLEOSPIN® RNA/DNA BUFFER SET IN THE USA IS PROHIBITED FOR PATENT REASONS.

| Product | REF | Pack of |
|-------------------------|------------|----------------|
| rDNase Set | 740963 | 1 set |
| NucleoSpin® Filters | 740606 | 50 |
| Collection Tubes (2 mL) | 740600 | 1000 |

6.3 Literature

Fliege S, Pfaffl MW.: RNA integrity and the effect on the real-time qRT-PCR performance. *Mol Aspects Med.* 2006 Apr-Jun; 27(2-3):126-39. Epub 2006 Feb 15. Review.

Imbeaud S, Graudens E, Boulanger V, Barlet X, Zaborski P, Eveno E, Mueller O, Schroeder A, Auffray C.: Towards standardization of RNA quality assessment using user-independent classifiers of microcapillary electrophoresis traces. *Nucleic Acids Res.* 2005 Mar 30;33(6):e56.

Miller CL, Diglisic S, Leister F, Webster M, Yolken RH.: Evaluating RNA status for RT-PCR in extracts of postmortem human brain tissue. *Biotechniques.* 2004 Apr; 36(4):628-33.

Schoor O, Weinschenk T, Hennenlotter J, Corvin S, Stenzl A, Rammensee HG, Stevanovic S.: Moderate degradation does not preclude microarray analysis of small amounts of RNA. *Biotechniques.* 2003 Dec; 35(6):1192-6, 1198-201.

6.4 Product use restriction/warranty

NucleoSpin® RNA Clean-up XS 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

Please contact:
MACHEREY-NAGEL GmbH & Co. KG
Tel.: +49 24 21 969-270
tech-bio@mn-net.com

Trademarks:

LightCycler™ is a trademark of a member of the Roche Group
NucleoSpin® is a registered trademark of MACHEREY-NAGEL GmbH & Co KG
SYBR® is a registered trademark of Molecular Probes, Inc.

All used names and denotations can be brands, trademarks, or registered labels of their respective owner – also if they are not special denotation. To mention products and brands is only a kind of information (i.e., it does not offend against trademarks and brands and can not be seen as a kind of recommendation or assessment). Regarding these products or services we can not grant any guarantees regarding selection, efficiency, or operation.