Bioanalysis

MACHEREY-NAGEL

DNA purification from hard-to-lyse samples

Efficient & fast DNA extraction

Struggling with DNA isolation from hard-to-lyse samples?

- Benefit from our individual and convenient solutions
- Bead Tubes for efficient homogenization included
- Up to 60% more DNA compared to standard extraction methods

Genomic DNA from hard-to-lyse samples

DNA isolation kit overview

Product	Standard sample material	Bead Tubes
NucleoSpin® DNA Stool – New –	Fresh or frozen stool samples (human / animal)	Type A (included)
NucleoSpin® DNA Insect – New –	Insects, crustaceans	Type D (included) Type E (optional, to be ordered separately)
NucleoSpin® DNA Lipid Tissue – New –	Lipid-rich tissue such as brain, adipose tissue, fatty fish	Type D (included) Type E (optional, to be ordered separately)
NucleoSpin® Microbial DNA	Cultured microbes (bacteria, yeast, fungi)	Type B (included) Type C (optional, to be ordered separately)
NucleoSpin® Soil	Soil and sediment	Type A (included)

NucleoSpin® Bead Tubes overview

NucleoSpin® Bead Tubes	Standard sample material
Type A 0.6–0.8 mm ceramic beads	Soil or stool samples
Type B 40–400 µm glass beads	Bacteria
Type C 1–3 mm corundum	Yeast, fungi
Type D 3 mm steel balls – New –	Insects, crustaceans, lipid-rich samples
Type E combination of 3 mm steel balls and 40–400 µm glass beads – New –	Bacteria within insect or tissue samples

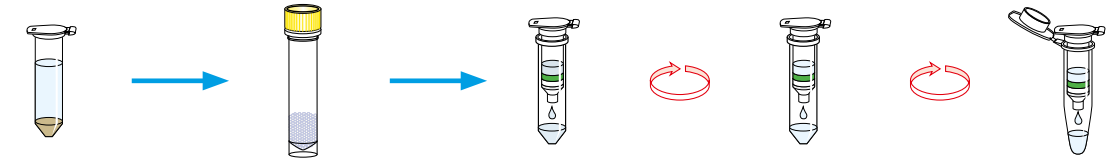
MN Bead Tube Holder

Enables efficient lysis on a Vortex-Genie® in just 20 min!

Procedure

Sample disruption with NucleoSpin® Bead Tubes and the MN Bead Tube Holder or common disruption devices possible!

See user manuals for details on NucleoSpin® Bead Tube processing and procedures.



NucleoSpin® DNA Stool

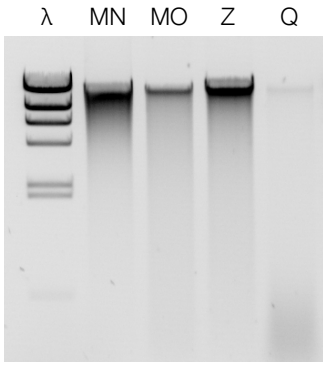
- New inhibitor removal technology for efficient removal of PCR inhibitors (like polysaccharides or bile salts in stool samples)
- Lysis is supported by mechanical disruption with ceramic beads

Product at a glance

Technology	Silica-membrane technology combined with Bead Tubes Type A
Sample material	< 100 mg fresh or frozen stool samples (human / animal)
Fragment size	200 bp–approx. 50 kbp
Typical yield	Depends on sample type, quality, and water content
A_{260}/A_{280}	1.7–1.9
Elution volume	30–100 µL
Preparation time	60 min
Binding capacity	50 µg

Application data

A



B

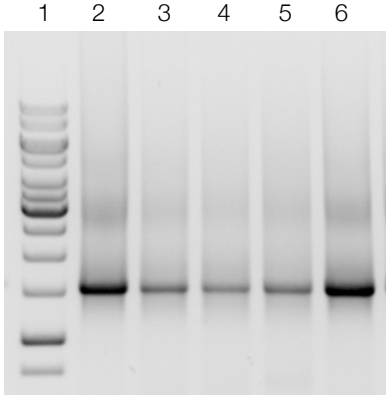
	MN	MO	Z	Q
Yield DNA [µg]	9.2	5.8	6.9	7.4
A_{260}/A_{280}	1.8	1.7	1.5	1.9
A_{260}/A_{230}	2.1	1.6	1.2	1.9

High genomic DNA yield and purity from human stool samples.

DNA was isolated from human stool samples with the NucleoSpin® DNA Stool kit (MN) and with competitor products (MO, Z, Q).

A: The DNA was extracted according to manufacturers' protocols and 5% of the eluate were subjected to gel electrophoresis.

B: DNA yield and quality of the samples shown in (A) were assessed by means of UV absorption measurement. The genomic DNA isolated with the NucleoSpin® DNA Stool kit showed superior yield and quality.



Efficient removal of PCR inhibitors from various sample sources.

DNA was isolated from human and animal feces samples with the NucleoSpin® DNA Stool kit. 5 µL of undiluted eluate served as template for the amplification of a 1.5 kb fragment from the bacterial 16S rRNA gene in an endpoint-PCR (35 cycles). The DNA extracted with the NucleoSpin® DNA Stool kit works undiluted in a PCR reaction, indicating the successful removal of PCR inhibitors.

Lane 1: GeneRuler™ 1kb Ladder (Thermo)

Lane 2: Feline

Lane 3: Sheep

Lane 4: Rabbit

Lane 5: Mouse

Lane 6: Human

Ordering information

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

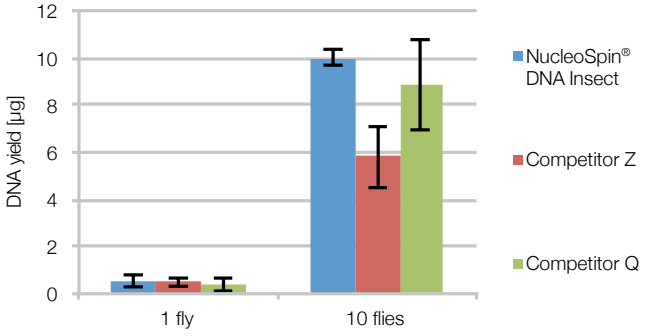
NucleoSpin® DNA Insect

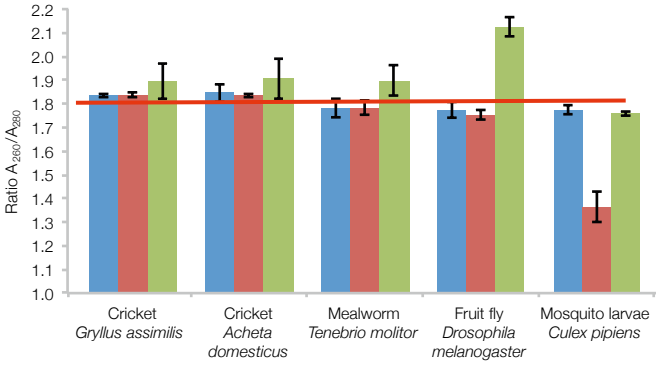
Lysis of an exoskeleton is supported by mechanical disruption with steel balls

Product at a glance

Technology	Silica-membrane technology combined with Bead Tubes Type D
Sample material	≤ 40 mg fresh, frozen, dried, or ethanol preserved insect / crustacean samples
Fragment size	200 bp–approx. 50 kbp
Typical yield	≤ 25 µg (varies by sample and disruption device)
A_{260}/A_{280}	1.7–1.9
Elution volume	25–200 µL
Preparation time	35 min/6 preps
Binding capacity	60 µg

Application data



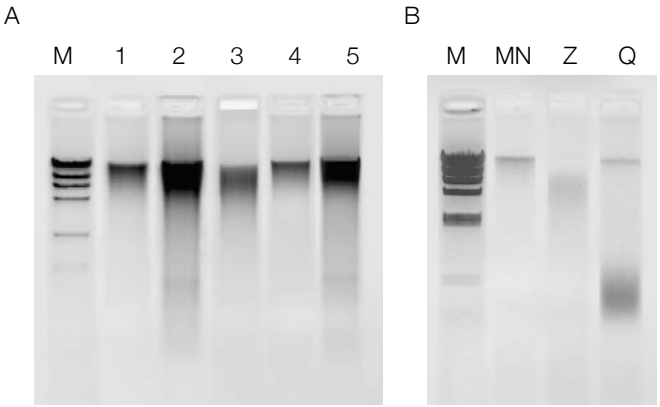


Excellent DNA recovery even from small samples

Genomic DNA was isolated from *Drosophila melanogaster* with the NucleoSpin® DNA Insect kit and with two competitor kits according to the standard procedure. DNA yield was measured by qPCR, showing a highly efficient recovery with the NucleoSpin® DNA Insect kit even for low amounts of material.

High purity of genomic DNA

DNA was isolated from various insect samples using the NucleoSpin® DNA Insect kit and standard competitor products according to manufacturers' protocols. The ratio of absorbance at 260 nm and 280 nm was calculated to assess purity of the isolated DNA. The optimal value of "1.8" is marked by a red line. DNA isolated with the NucleoSpin® DNA Insect kit was consistently pure.



Superior yield and quality of DNA

A: DNA from different species was isolated with the NucleoSpin® DNA Insect kit and separated by an agarose gel electrophoresis. 1 = fruit fly, 2 = mosquito larvae, 3 = field cricket, 4 = house cricket, 5 = mealworm. High molecular weight DNA was observed in all samples

B: DNA was isolated from a single fruit fly (*D. melanogaster*) with three different extraction methods. Intact and pure high molecular weight DNA was isolated with the NucleoSpin® DNA Insect kit (MN). Extraction with competitor kits resulted in DNA degradation (Z) or RNA contamination (Q).

Ordering information

Product	Preps	REF
NucleoSpin® DNA Insect	10/50	740470.10/.50

NucleoSpin® DNA Lipid Tissue

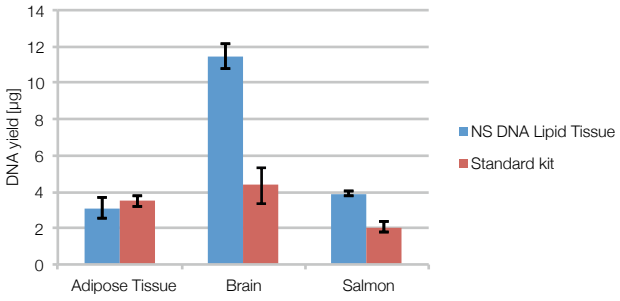
- Efficient lysis of lipid tissues is supported by mechanical disruption with steel balls
- Special buffer composition for efficient removal of lipids

Product at a glance

Technology	Silica-membrane technology combined with Bead Tubes Type D
Sample material	≤ 40 mg fresh or frozen, lipid-rich tissues (e.g., brain, adipose tissue, fatty fish tissue)
Fragment size	200 bp–approx. 50 kbp
Typical yield	Depends on sample type, quality, and water content
A_{260}/A_{280}	1.7–1.9
Elution volume	25–200 µL
Preparation time	35 min/6 preps
Binding capacity	60 µg

Application data

A



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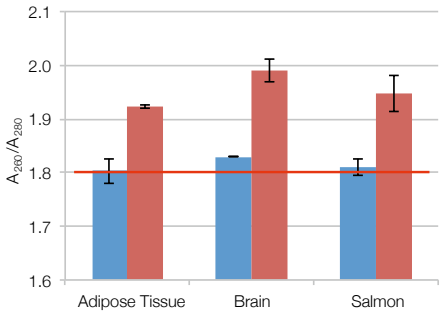


Excellent yield and quality of genomic DNA purified from various lipid tissues

DNA was isolated from different lipid-rich samples using the NucleoSpin® DNA Lipid Tissue kit and a standard extraction kit according to manufacturers' protocols.

A: DNA yield was assessed by measurement of the absorption. DNA was efficiently isolated wit the MN NucleoSpin® DNA Lipid Tissue kit even from difficult tissues like brain.

B: The ratio of absorbance at 260 nm and 280 nm was calculated to assess purity of the isolated DNA. The optimal value of "1.8" is marked by a red line. DNA isolated with the NucleoSpin® DNA Lipid Tissue kit was consistently pure.

High molecular weight DNA without RNA contamination

High molecular weight DNA is obtained with the NucleoSpin® DNA Lipid Tissue kit without RNA contamination. However RNA contamination (blue circles) is visible when lipid-rich samples are processed with a standard kit.

Ordering information

Product	Preps	REF
NucleoSpin® DNA Lipid Tissue	10/50	740471.10/.50

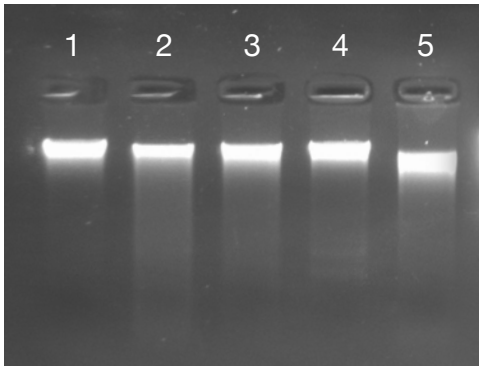
NucleoSpin® Microbial DNA

- Reliable isolation of DNA from microorganisms including yeast, fungi, Gram-negative and Gram-positive bacteria
- Lysis is supported by mechanical disruption with glass beads

Product at a glance

Technology	Silica-membrane technology combined with Bead Tubes Type B (optional Type C)
Sample material	< 40 mg wet weight cell pellet
Fragment size	200 bp–approx. 50 kbp
Typical yield	Depends on sample type and disruption Approx. 5–25 µg (30 mg wet weight cell pellet)
A_{260}/A_{280}	1.6–2.0
Elution volume	100–200 µL
Preparation time	35 min/6 preps
Binding capacity	60 µg

Application data



Efficient DNA recovery from different microorganisms

DNA was isolated with the NucleoSpin® Microbial DNA kit and NucleoSpin® Bead Tube Type B (included in the kit) or NucleoSpin® Bead Tube Type C (see ordering information). 100 ng DNA per prep was analyzed by agarose gel electrophoresis showing high molecular DNA without RNA contamination or DNA degradation.

1. *Escherichia coli*, NucleoSpin® Bead Tube Type B
2. *Vibrio fischerii*, NucleoSpin® Bead Tube Type B
3. *Bacillus subtilis*, NucleoSpin® Bead Tube Type B
4. *Corynebacterium glutamicum*, NucleoSpin® Bead Tube Type B
5. *Saccharomyces cerevisiae*, NucleoSpin® Bead Tube Type C

Microorganism	Tested by
Acinetobacter spec.	customer
Aspergillus spec.	MN
Bacillus subtilis	MN
Clostridium ljungdahlii	customer
Corynebacterium glutamicum	MN
Escherichia coli	MN
Eurotium spec.	customer
Klebsiella pneumoniae	customer
Microbacterium spec.	customer
Pichia pastoris	customer
Pseudomonas aeruginosa	customer
Rhizopus spec.	MN
Saccharomyces cerevisiae	MN
Staphylococcus epidermis	customer
Streptococcus pneumoniae	customer
Trametes spec.	customer
Vibrio fischerii	MN

Various applications

DNA was successfully isolated from the above mentioned microorganisms with the NucleoSpin® Microbial DNA kit.

Ordering information

Product	Preps	REF
NucleoSpin® Microbial DNA	10/50	740235.10/.50

NucleoSpin® Soil

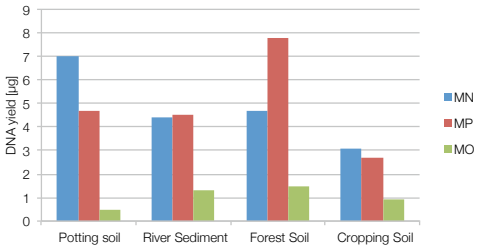
- Approved inhibitor removal technology for efficient removal of PCR inhibitors (like humic acids in soil samples)
- Lysis is supported by mechanical disruption with ceramic beads

Product at a glance

Technology	Silica-membrane technology combined with Bead Tubes Type A
Sample material	< 500 mg soil, sludge, or sediment
Fragment size	50 bp–approx. 50 kbp
Typical yield	2–10 µg (500 mg soil)
A_{260}/A_{280}	1.6–1.8
Elution volume	30–100 µL
Preparation time	90 min/10 preps
Binding capacity	50 µg

Application data

A



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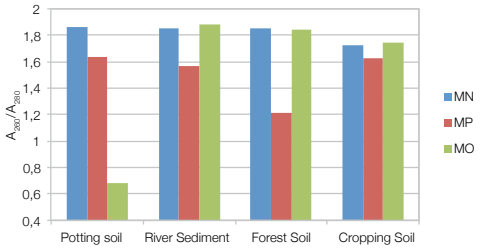

Excellent DNA recovery and quality tested for various soil samples

DNA was isolated from different soil samples using the NucleoSpin® Soil kit and two competitor products according to manufacturers' protocols. The ratio of absorbance at 260 nm and 280 nm was calculated to assess purity of the isolated DNA. High yields of DNA were isolated from all samples with the NucleoSpin® Soil kit (A). In addition, samples that were isolated with the NucleoSpin® Soil kit mostly reached a value of "1.8", showing a high purity of the isolated DNA (B).

References

Merckx et al.: Evolution of endemism on a young tropical mountain

Nature 2015; 524(7565): 347-50

„(…) Soil samples containing fungal mycelia were processed (...). Genomic DNA was extracted from 1 g of this sample using the NucleoSpin® Soil kit (Macherey-Nagel Gmbh & Co., Düren, Germany), according to the manufacturer's protocol. (…)"

Wagner et al.: Effect of DNA extraction procedure, repeated extraction and ethidium monoazide (EMA)/propidium monoazide (PMA) treatment on overall DNA yield and impact on microbial fingerprints for bacteria, fungi and archaea in a reference soil

Appl Soil Ecol. 2015; 93: 56-64

„(…) By comparison of two different extraction kits, the Macherey-Nagel Soil kit resulted in the highest DNA yields when buffer SL1 and the enhancer solution were applied. (…)"

Ordering information

Product	Preps	REF
NucleoSpin® Soil	10/50/250	740780.10/.50/.250

Kits for genomic DNA extraction

Ordering information

Genomic DNA from hard-to-lyse samples	Preps / Pack of	REF
NucleoSpin® DNA Stool	10/50	740472.10/.50
NucleoSpin® DNA Insect	10/50	740470.10/.50
NucleoSpin® DNA Lipid Tissue	10/50	740471.10/.50
NucleoSpin® Microbial DNA	10/50	740235.10/.50
NucleoSpin® Soil	10/50/250	740780.10/.50/.250
Accessories for hard-to-lyse samples		
NucleoSpin® Bead Tubes Type A	50	740786.50
NucleoSpin® Bead Tubes Type B	50	740812.50
NucleoSpin® Bead Tubes Type C	50	740813.50
NucleoSpin® Bead Tubes Type D	50	740814.50
NucleoSpin® Bead Tubes Type E	50	740815.50
MN Bead Tube Holder	1	740469
Genomic DNA from tissue and cells		
NucleoSpin® Tissue	10/50/250	740952.10/.50./250
NucleoSpin® Tissue XS	10/50/250	740901.10/.50/.250
Genomic DNA from blood		
NucleoSpin® Blood	10/50/250	740951.10/.50/.250
NucleoSpin® Dx Blood	50/250	740899.50/.250
NucleoSpin® Blood L	20	740954.20
NucleoSpin® Blood XL	10/50	740950.10/.50
Genomic DNA from FFPE samples		
NucleoSpin® DNA FFPE XS	10/50/250	740980.10/.50/.250
Genomic DNA from plant and fungi		
NucleoSpin® Plant II	10/50/250	740770.10/.50/.250
NucleoSpin® Plant II Midi	20	740771.20
NucleoSpin® Plant II Maxi	10	740772.10
Genomic DNA from food and feed		
NucleoSpin® Food	10/50/250	740945.10/.50/.250

Please visit our website for high-throughput solutions for the extraction of genomic DNA: *www.mn-net.com/gDNA*

www.mn-net.com

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