NucleoSpin® Soil

Genomic DNA Purification Products from MACHEREY-NAGEL

Genomic DNA from environmental samples

We dug out an expert …

NucleoSpin® Soil

Alternative lysis systems – highest yield from diverse samples!

Ceramic beads included – most efficient cell disruption!

Highest purity – complete removal of PCR inhibitors!

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Genomic DNA from environmental samples

Alternative lysis systems – highest yield from diverse samples!

Two different lysis buffers plus optional addition of the chemical additive Enhancer SX allow fine tuning for maximum yield and purity.
Designed for Gram+/- bacteria, archaea, fungi, and algae in soil, sludge, and sediment samples.

Ceramic beads included – most efficient mechanical cell disruption!

Ready-to-use NucleoSpin® Bead Tubes with ceramic beads included.
Used in a bead mill or vortexer.
Efficient mechanical pulping even for Gram+ bacteria and spores.

Highest purity – complete removal of PCR inhibitors!

NucleoSpin® Inhibitor Removal Columns and efficient wash buffers will eliminate PCR inhibitors.
DNA can mostly be used undiluted as a PCR template.
Highest sensitivity even for rare targets.

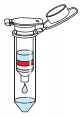
Procedure

Homogenization and lysis

Add sample and lysis buffer to NucleoSpin® Bead Tube, vortex or use homogenizer

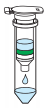
Removal of contaminants

Precipitate contaminants



Load supernatant to NucleoSpin® Inhibitor Removal Columns

Bind – Wash – Elute



Bind DNA to NucleoSpin® Soil Column, apply efficient wash steps, dry the membrane

Elute pure DNA ready to use in downstream PCR

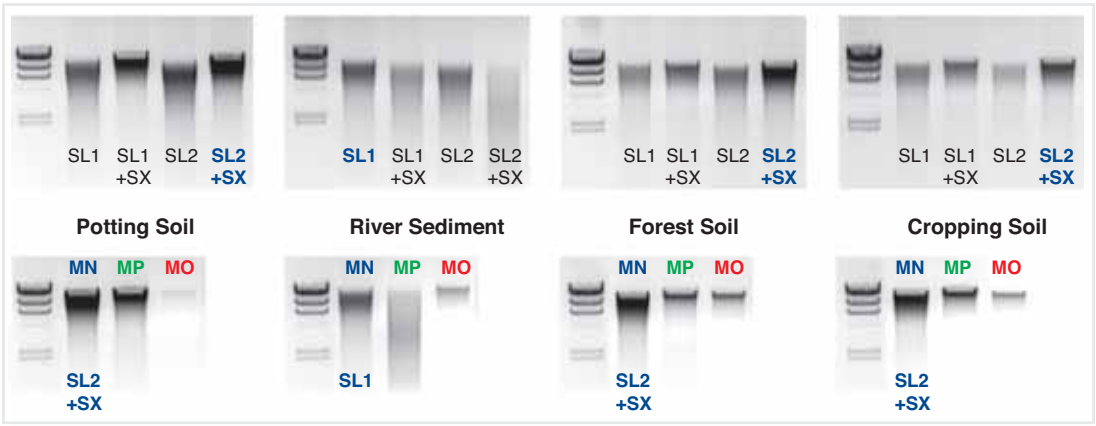
Product at-a-glance

Technology	Silica-membrane technology
Format	Mini spin columns
Sample size	up to 500 mg of soil, sludge, or sediment
Typical DNA yield	2 – 10 µg
Typical DNA quality	A_{260}/A_{280} = 1.7 – 1.9 and A_{260}/A_{230} > 1.5
Binding capacity	50 µg
Elution volume	30 – 100 µl
Preparation Time	< 90 min (10 preps)

Application data

Alternative lysis systems – select the lysis system most suitable for your sample!

A



B

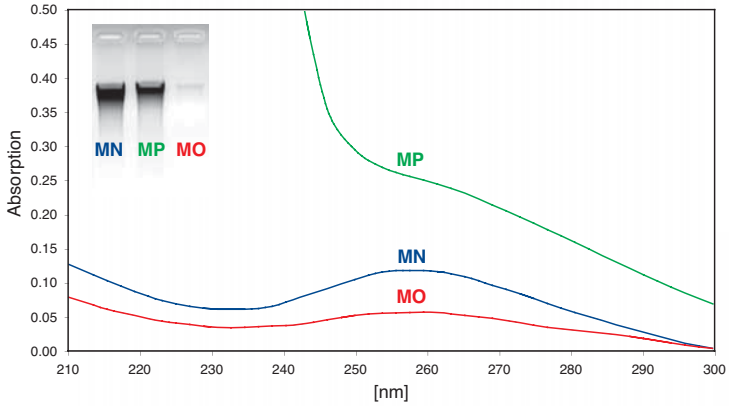
	MN Optimal Buffer	MP	MO
Potting Soil			
DNA Yield [µg]	7.0	4.7	0.5
A_{260}/A_{280}	1.86	1.64	1.68
A_{260}/A_{230}	1.94	0.20	0.63
River Sediment			
DNA Yield [µg]	4.4	4.5	1.3
A_{260}/A_{280}	1.85	1.57	1.88
A_{260}/A_{230}	1.93	0.20	1.36
Forest Soil			
DNA Yield [µg]	4.7	7.8	1.5
A_{260}/A_{280}	1.85	1.21	1.84
A_{260}/A_{230}	1.90	0.58	0.62
Cropping Soil			
DNA Yield [µg]	3.1	2.7	0.9
A_{260}/A_{280}	1.72	1.63	1.74
A_{260}/A_{230}	0.99	0.12	1.09

A: Upper panel: Total DNA from different starting materials was purified with NucleoSpin® Soil using the two different lysis buffers SL1 and SL2. Both lysis buffers were used with and without Enhancer SX (thus the kit includes four different lysis options in total).
Lower panel: Total DNA from potting soil, river sediment, forest soil, and cropping soil was purified with NucleoSpin® Soil (MN) using the optimal lysis buffer system (see upper pannel) and two competitor kits MP and MO.

B: Tabular overview of yield and purity for all samples shown in figure A.

NucleoSpin® Soil outperforms competitors in yield and purity!

A



B

A: Total DNA from forest soil was purified with NucleoSpin® Soil (MN) and competitor kits (MP and MO).
Compared to the very low yield of competitor MO, the DNA purified with NucleoSpin® Soil exhibits a UV-VIS spectrum of pure DNA with a maximum absorption at 260 nm and an ideal A_{260}/A_{230} ratio of 1.90. DNA purified by competitor MP shows a significant increase in absorption below 260 nm indicating massive copurification of humic substances (A_{260}/A_{230} ratio of 0.58!) which is additionally shown by its colored eluate (**B**). Thus, most of the absorption at 260 nm is caused by impurities. DNA quantification based on an A_{260} measurement highly overestimates the real DNA yield (see DNA on the agarose gel as a comparison).

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Application data (cont.)

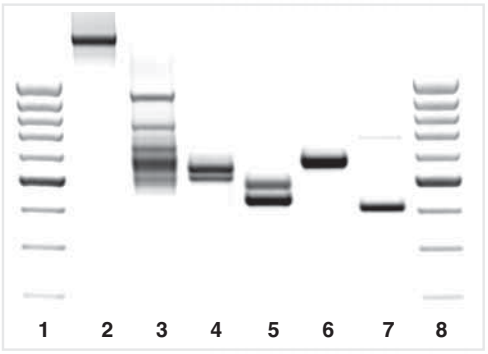
Complete removal of PCR inhibitors – PCR results even from undiluted eluates!

lane 1: NucleoSpin® Soil (SL1)
lane 2: NucleoSpin® Soil (SL1+SX)
lane 3: NucleoSpin® Soil (SL2)
lane 4: NucleoSpin® Soil (SL2+SX)
lane 5: Competitor MP
lane 6: Competitor MO

DNA was purified with NucleoSpin® Soil using Lysis Buffers SL1 and SL2 with and without Enhancer SX as well as with kits from competitor MP and MO. Then, 2 µl of undiluted eluate were used as PCR template with fungi specific internal transcribed spacer (ITS) primers. Competitor MP failed to yield DNA pure enough to be used undiluted. DNA and inhibitor concentration were both low for competitor MO, but the PCR from river sediment samples was still strongly inhibited.
With NucleoSpin® Soil there were at least two conditions for each soil type yielding plenty of DNA and working undiluted in PCR.

Note: Samples failing to show PCR amplification might be rescued by using a diluted portion of the elution fraction as PCR template as the inhibitor concentration will also be diluted. However, diluting the template might also reduce the concentration of a target below its detection limit!

Efficient lysis system – even suitable for difficult-to-lyse microorganisms!



Total DNA from 400 mg cropping soil was purified with NucleoSpin® Soil using Lysis Buffer SL2 in combination with Enhancer SX. 2 µl of undiluted eluates were analyzed in PCR using order specific primer systems.

Lane 1: 1 kb DNA Ladder (Fermentas)
Lane 2: Procaryotes (16S rRNA gene)
Lane 3: Eucaryotes (ITS)
Lane 4: Fungi (ITS)
Lane 5: Fungi (ß-Tubulin)
Lane 6: Algae, Protozoae, Fungi (18S rRNA)
Lane 7: Gram+ (*B. subtilis*, *cerA*)
Lane 8: 1 kb DNA Ladder (Fermentas)

Ordering information

Product	Preps	REF
Mini spin columns		
NucleoSpin® Soil	10/50/250	740780.10/.50/.250
Mini spin kit for isolation of genomic DNA from environmental samples		
Related products		
Mini spin columns		
NucleoSpin® Tissue	10/50/250	740952.10/.50/.250
Mini spin kit for isolation of genomic DNA from tissue and cells		
NucleoSpin® Plant II	10/50/250	740770.10/.50/.250
Mini spin kit for isolation of genomic DNA from plant and fungi		
Mini spin columns – XS design		
NucleoSpin® Tissue XS	10/50/250	740901.10/.50/.250
Mini spin kit for isolation of genomic DNA from very small amounts of tissue and cells		

Visit ***www.mn-net.com/bioanalysis*** for detailed information

Your local distributor:

KATEN300053/NuSpin Soil en1/10.0/02.2010 PD Printed in Germany
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