DNA from food

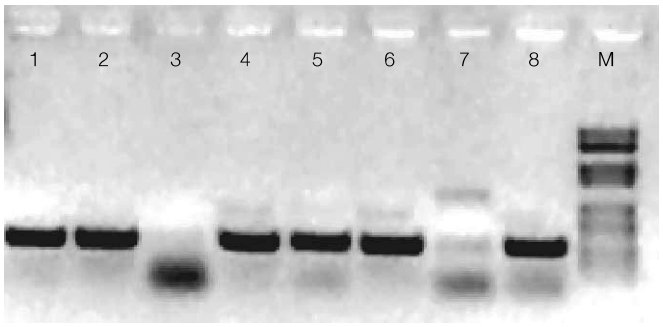
NucleoSpin® Food

For rapid isolation of DNA from food and feed

- Complete removal of PCR inhibitors – get high quality DNA
- Even low amounts of partially degraded DNA can be purified from complex matrices

	Mini NucleoSpin® Food	8-well NucleoSpin® 8 Food	96-well NucleoSpin® 96 Food
Technology	Silica membrane technology	Silica membrane technology	Silica membrane technology
Sample material	5–200 mg food or feed	< 200 mg food or feed	< 200 mg food or feed
Fragment size	300 bp–approx. 50 kbp	300 bp–approx. 50 kbp	300 bp–approx. 50 kbp
Typical yield	Depending on individual sample, storage, and processing	Depending on individual sample, storage, and processing	Depending on individual sample, storage, and processing
Elution volume	100 µL	100–200 µL	100–200 µL
Binding capacity	30 µg	30 µg	30 µg
Preparation time	30 min/6 preps	60 min/48 preps (excl. lysis)	120 min/plate (excl. lysis)

Application data



Data kindly provided by GEN-IAL, Troisdorf, Germany

Beef detection in sausage products

DNA preparation was done according to the NucleoSpin® Food standard protocol. Aliquots of the 100 µL eluates were amplified with primers and components of a commercial kit (CIBUS, Germany). Bovine DNA could be detected in several products, even in strongly processed samples.

Sample 8 was declared to be prepared from duck meat only, but clearly showed presence of beef. Samples 3 and 7 did not contain detectable amounts of bovine DNA.

Ordering information

Product	Preps	REF
NucleoSpin® Food	10 / 50 / 250	740945.10 / .50 / .250
NucleoSpin® 8 Food	12 x 8 / 60 x 8	740975 / .5
NucleoSpin® 96 Food	2 x 96 / 4 x 96 / 24 x 96	740976.2 / .4 / .24

DNA from food

NucleoMag® DNA Food

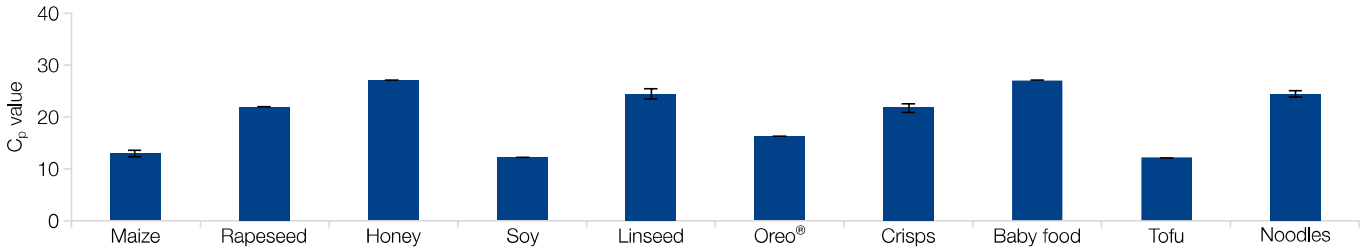
Flexible DNA isolation from various food and feed samples

- Get even low amounts of partially degraded DNA from complex matrices
- Suitable for species identification, GMO detection

	Mag NucleoMag® DNA Food
Technology	Magnetic bead technology
Sample material	< 200 mg food or feed
Binding capacity	300 bp–approx. 50 kbp
Typical yield	0.1–10 µg
Elution volume	50–200 µL
Binding capacity	0.4 µg/µL beads
Processing time	120 min/96 preps*

* Established on KingFisher® Flex.

Application data



NucleoMag® DNA Food is able to isolate DNA from various food samples

Various food samples have been uses as input for DNA isolation. Sample homogenization and lysis was performed manually, whereas DNA isolation was performed automated using a KingFisher® Flex. DNA presence within the eluates was determined using qPCR.

Overview of different sample types that have been successfully tested in our R&D

In all cases, DNA was successfully isolated using NucleoMag® DNA Food. Presence of DNA was tested for either by qPCR or via agarose gel electrophoresis

Category	Tested sample material
Raw, vegetable origin	Carrot, potato, soy, maize, rapeseed, linseed, oat, rice, wheat, sunflower seed, grape, seeds (tomato, cucumber, aubergine, melon, pepper), animal food
Raw, animal origin	Deer, pork
Processed, vegetable origin	Agave nectar, oatmeal
Processed, animal origin	Milk, cheese, honey, salami, meat sausage, liver sausag
Complex processed, vegetable origin	Vegetable broth, crisps, pastry, coce, fried onions, tea, spices, tofu, juice, cereal bar, bread
Complex processed, animal origin	Tiramisu, fruit gum, licorice, chocolate, Nutella®, noodles, baby food, oil, dripping

Ordering information

Product	Preps	REF
NucleoMag® DNA Food	1 x 96 / 4 x 96	744945.1 / .4

MACHEREY-NAGEL

NucleoSpin® Food

Reliable purification of DNA from a variety of commercially important crop seeds

Introduction

Whether as a tool for developing of new breeds through marker-assisted selection and hybridization or as a way of tracking the presence of GMO in crops, genotyping is playing an increasingly important role in modern food production. This is especially relevant in cultivating seeds and grains.

Direct genotyping of seeds saves time and resources required for plant germination and allows for analysis prior to planting season. Extracting sufficient amounts of high quality DNA from a variety of seed samples is therefore an important prerequisite for commercial genotyping of crops.

However, extracting DNA from seeds is complicated by the presence of nutritional macromolecules as well as the inherently low amounts of DNA in the sample. Methods for extracting DNA from seed samples tend to be either laborious and complicated or deliver low quality DNA unsuited for many PCR applications.

MACHEREY-NAGEL has developed NucleoSpin® Food for DNA extraction from diverse, challenging food matrices. Due to its robust buffer chemistry and a resilient silica membrane, the kit has proven to work with a variety of challenging samples. This application note demonstrates that NucleoSpin® Food can be used for routine extraction of high quality DNA suitable for PCR analysis from a variety of commercially important seed samples. Furthermore, a single protocol can be applied to all seed samples, allowing for even simpler processing.

Materials and methods

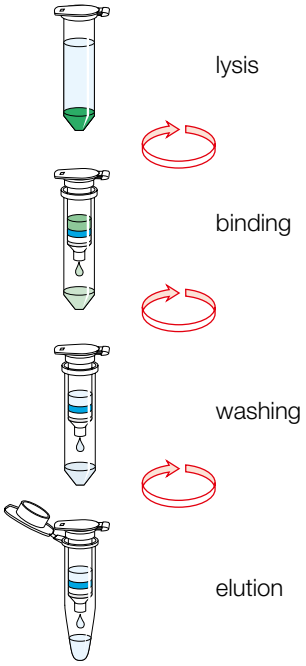
For each sample, 200 mg of material was homogenized in liquid nitrogen with mortar and pestle. Sample lysis and subsequent DNA isolation were performed following the standard protocol of NucleoSpin® Food. Elution was performed with 100 µL of elution buffer CE. For each eluate, 10 µL were used for spectrophotometric analysis and 2 µL were analyzed on a 1 % TAE agarose gel. A further 1 µL was diluted 1:100 and analyzed by qPCR (1 µL of the diluted sample in a 20 µL reaction mix) with specific primers.

Product at a glance

General properties of NucleoSpin® Food

NucleoSpin® Food	
Technology	Silica membrane technology
Format	Mini spin columns
Sample material	5–200 mg
Fragment size	300 bp–approx. 50 kbp
Typical yield	0.1–10 µg (200 mg food)
A_{260}/A_{280}	1.6–1.9
Elution volume	100 µL
Preparation time	30 min/6 preps
Binding capacity	30 µg

NucleoSpin® Food procedure

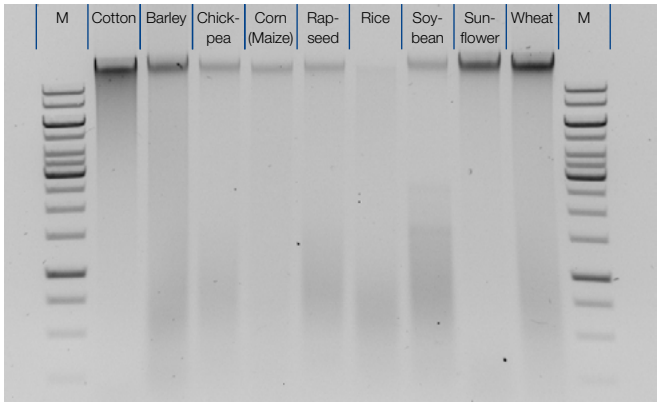


Application data

High DNA yields from various seed samples

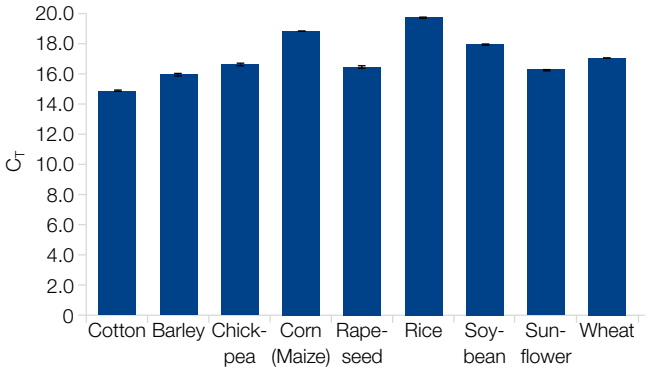
Several seed samples were prepared according to the standard protocol of NucleoSpin® Food. For each sample, 10 µL of eluate were analyzed by spectrophotometer. Successful isolation of DNA could be demonstrated in each case.

Sample	Species name	Yield (µg)
Cotton	*Gossypium herbaceum*	91
Barley	*Hordeum vulgare*	106
Chickpea	*Cicer arietinum*	61
Corn (Maize)	*Zea mays*	154
Rapeseed	*Brassica napus*	92
Rice	*Oryza sativa*	79
Soybean	*Glycine max*	113
Sunflower	*Helianthus annuus*	60
Wheat	*Triticum aestivum*	66



Reliable extraction of DNA from various seed matrices

After spectrophotometric analysis, DNA purified from several seed samples was further examined by agarose gel electrophoresis. For each sample 2 µL of eluate were loaded onto a 1 % agarose gel. The marker (M) was 1 kB ladder (Fermentas). While the amounts of extracted DNA varied between different sample types, in each case detectable amounts of DNA could be reliably extracted from 200 mg of sample.



Amounts and quality of the extracted DNA were sufficient for detection by qPCR

The extracted samples were analyzed by qPCR with the Eu +/- marker. The purity and concentration of DNA were sufficient for reliable detection of the genetic marker and thus suitable for genotyping.

Summary

NucleoSpin® Food allows routine extraction of high quality DNA from even the most difficult seed samples. The high yields and purity of the extracted DNA lead to accurate and reliable results from downstream analyses such as PCR, including qPCR. This in turn permits quick and affordable genotyping of highly important crops such as rice, maize, wheat and soybean.

Ordering information

Product	Specifications	Preps	REF
NucleoSpin® Food	NucleoSpin® Food Columns, Collection Tubes (2 mL), buffers, Proteinase K	10 / 50 / 250	740945.10 / .50 / .250

Bioanalysis

MACHEREY-NAGEL

Isolation of DNA from yeast

NucleoSpin® DNA Yeast

- Optimized lysis with MN Bead Tubes Type C
- Up to 100 mg of sample input
- High genomic DNA yields

Isolation of DNA from yeast

NucleoSpin® DNA Yeast

For DNA from yeast: Don't lyse hard, lyse smart!

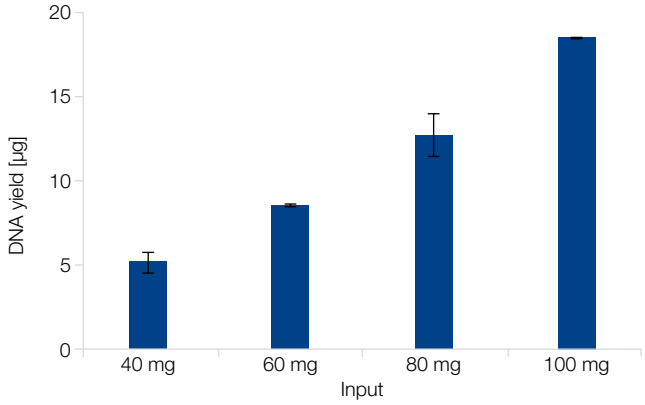
Protocols for isolation of DNA from yeast typically include either a chemical treatment to weaken the cell walls or a mechanical lysis with glass beads. The former requires additional hands-on time, the latter often is inefficient leading to prolonged lysis times and low DNA yields.

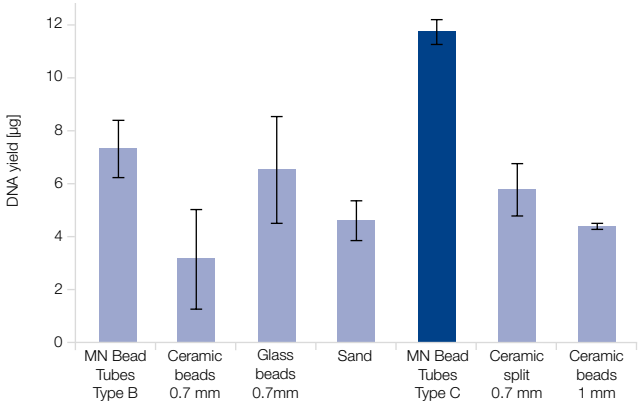
The NucleoSpin® DNA Yeast kit contains MN Bead Tubes Type C with corundum beads for most efficient lysis. Using corundum beads improves the lysis resulting in a drastically increased DNA yield. The kit delivers superior yields for various, popular yeast species, including *Saccharomyces cerevisiae*, *Schizosachharomyces pombe* and *Pichia pastoris*.

Product specifications

Technology & Format	Silica membrane mini spin kit
Sample material	Yeast, fungi
Sample amount	≤ 100 mg (wet weight)
Fragment size	200 bp – approx. 50 kpb
Typical yield	Up to 20 µg (depending on sample amount and quality)
Elution volume	100 – 200 µL
Processing time	35 min / prep

Application data





High DNA yields and efficient sample disruption from up to 100 mg sample

A) DNA was purified from 40–100 mg of cultured yeast (wet weight). DNA yield linearly increases with sample input.
B) Yeast samples (40 mg) were subjected to mechanical lysis with different types of beads. MN Bead Tubes Type C deliver the highest DNA yield in subsequent purification with NucleoSpin® DNA Yeast kit.

Ordering information

Product	Specifications	Preps	REF
NucleoSpin® DNA Yeast	Mini prep kit for isolation of genomic DNA from yeast – NucleoSpin® DNA Yeast columns, MN Bead Tubes Type C, buffers, collection tubes	10 / 50	740236.10 / .50
MN Bead Tubes Type C	2 mL tubes with 1–3 mm corundum; for homogenization of yeast and fungi	50	740813.50

KATEN300220 · Flyer NucleoSpin DNA Yeast en1 / 1 / 0 / 09.2020 DD · Printed in Germany

www.mn-net.com

MACHEREY-NAGEL

MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6–8 · 52355 Düren · Deutschland

DE / International:
Tel.: +49 24 21 969-0
E-Mail: info@mn-net.com

CH:
Tel.: +41 62 388 55 00
E-Mail: sales-ch@mn-net.com

FR:
Tel.: +33 388 68 22 68
E-Mail: sales-fr@mn-net.com

US:
Tel.: +1 484 821 0984
E-Mail: sales-us@mn-net.com

MN Since 1911

Bioanalysis

MACHEREY-NAGEL

NucleoSpin® eDNA Water

Fast and reliable isolation of environmental DNA

- Fast workflow – pure eDNA in hours instead of days
- Ethylene oxide treated XS column – minimized risk of DNA contamination
- Compatible with diverse types of water, filtration systems and laboratory setups

Environmental DNA purification from water samples

NucleoSpin® eDNA Water

Setting new standards for environmental DNA purification from water samples

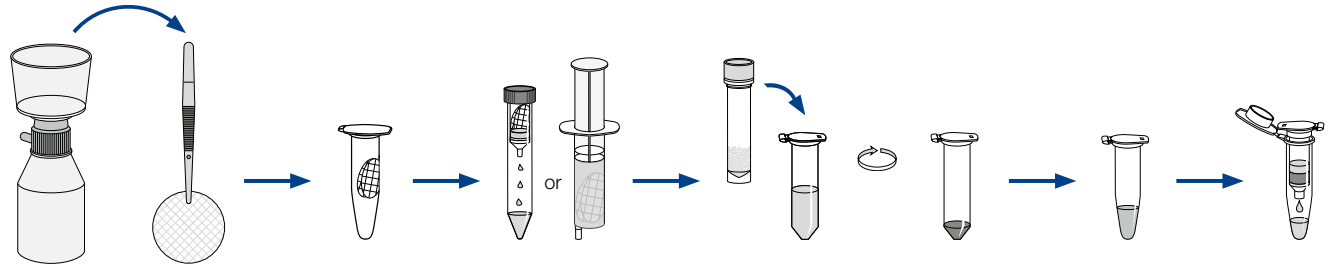
The NucleoSpin® eDNA Water kit enables fast purification of environmental DNA (eDNA) from diverse water samples with reliable results and minimal risk of DNA contamination. The combination of silica matrix with silica membrane columns enables efficient isolation of high quality DNA. NucleoSpin® eDNA Water provides a workflow for eDNA extraction from filters in less than 70 minutes, avoiding long, over-night incubation steps typical of eDNA workflows. Columns are ethylene oxide treated in order to minimize the risk of DNA contamination. NucleoSpin® eDNA is compatible with a variety of filters and filtration systems (not included in the kit), such as conventional bottle top round filters (e.g. 45 mm) as well as cartridge filters (e.g. Sterivex™). Further, an alternative protocol for direct eDNA precipitation circumventing water filtration is provided, enabling isolation of free DNA. These properties make NucleoSpin® eDNA Water ideal for eDNA studies of freshwater and saltwater ecosystems with varying levels of organic and inorganic matter.

The fastest eDNA Kit in the market!

Product at a glance

	NucleoSpin® eDNA Water
Technology	Silica bead suspension, XS column
Processing	Manual, centrifugation
Sample material	Freshwater and saltwater samples; Filters or untreated samples
Water sample volume	Up to several liters of water, depending on water quality and filtration system
DNA fragment size	> 100 bp
Elution volume	100 µL
Preparation time	60–70 min (without filtration / precipitation)
Quality level	EtOX treated columns (EtOX treated round filters are available separately)

Purification workflow



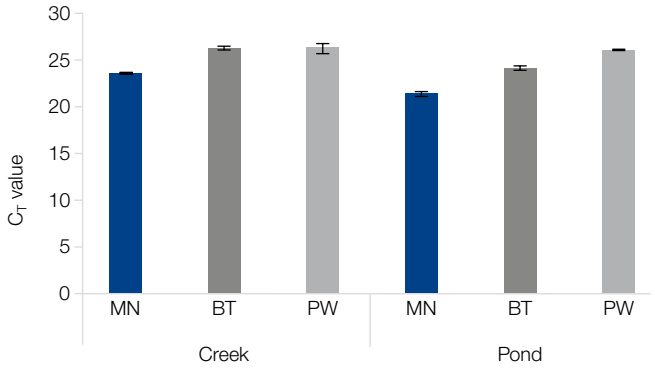
*Filtration device and NucleoSpin Filter / syringe for recovery not included in the kit

From filter to eDNA in under 70 minutes

The NucleoSpin® eDNA Water workflow has been optimized for speed and simplicity without compromizing the quality and purity of the DNA purified. Samples can be obtained either by filtration with round filters – like MACHEREY-NAGEL´s 45 mm Glass Fiber Filters (see ordering information) – or filter cartridges (Sterivex™). DNA is liberated from the filter by a strong lysis buffer. Alternatively, eDNA can be precipitated from < 40 mL of unfiltered water (protocol included; requires additional buffer PREC). NucleoTrap® Bead suspension efficiently binds the DNA, while minimizing carryover of contaminants. Following washing and drying steps, the bead suspension is transfered to a NucleoSpin® XS column, from which pure eDNA is eluted. The purification workflow takes less than 70 min. The full preparation time depends on the sampling and / or filtration setup.

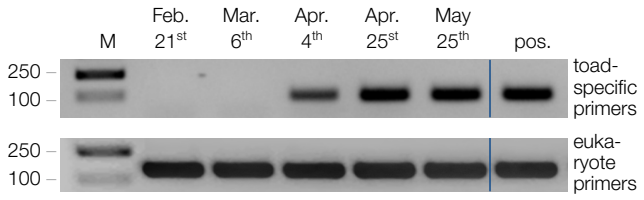
Environmental DNA purification from water samples

Application data



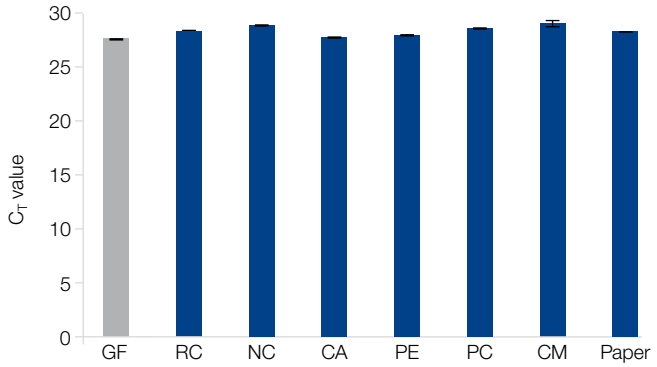
Superior downstream performance

eDNA was purified from running water (creek) and stagnant water (pond) using the NucleoSpin® eDNA Water kit as well as two common competitor kits and analyzed by qPCR for metazoan DNA. The NucleoSpin® eDNA Water kit performeds significantly better (lower Ct value) for both sample types.



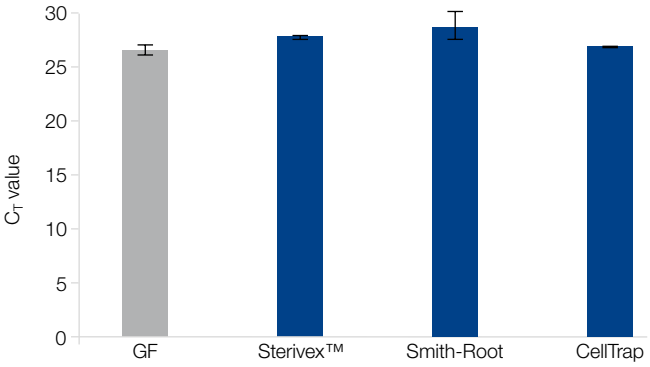
Seasonal traceability of European toad in a freshwater pond

In Germany, European toads become active after hibernation – usually in March – and typically start spawning in April. The presence of toads and / or spawn and tadpoles can be monitored by isolation of eDNA and subsequent PCR analysis. Here, we used the NucleoSpin® eDNA kit in combination with a NucleoSpin® Filter Midi for eDNA isolation. PCR primers were designed to amplify either toad-specific or general eukaryote eDNA.



Consistent performance with diverse round filters

Creek water (0,5 L) was filtered through different types of round filters: regenerated cellulose (RC), cellulose nitrate (NC), cellulose acetate (CA), polyester (PE), polycarbonate (PC) mixed cellulose ester (CM) and paper filter. All show a similar level of efficiency in combination with NucleoSpin® eDNA Water and are comparable to the recommended EO treated Glass Fiber Filter (GF). The glass fiber filter has the best flow-rate and the lowest risk of clogging.

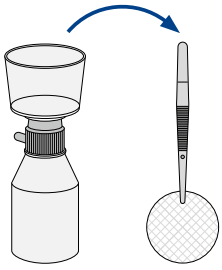


Compatibility with different water filtration systems

Samples of creek water were filtered through a Glass Fiber Filter (GF) as well as several filtration systems commonly used in conjunction with eDNA purification. The NucleoSpin® eDNA Water kit was then used to purify eDNA from each filter unit. The eluates were analyzed by qPCR for metazoan DNA. All filtration systems delivered comparable results.

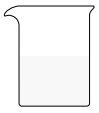
Environmental DNA purification from water samples

Options for sample pre-processing



Filtration and filter transfer*

Filter cartridge (e.g. Sterivex™)*



Direct precipitation from 40 mL water **

* Filtration devices and filters not included

** Requires additional buffer PREC

Ordering information

Product	Specifications	Preps / Pack of	REF
NucleoSpin® eDNA Water	For isolation of eDNA from water - NucleoSpin® eDNA XS Columns, NucleoTrap Suspension, Collection Tubes, buffers	10 / 50	740402.10 / .50
Recommended round filter (for bottle top filtration devices)			
Glass Fiber Filter (45 mm, EO-treated)	Glass fiber round filters, diameter 45 mm, treated with ethylene oxide	50	740564
Accessories for lysate recovery			
NucleoSpin® Filter Midi	Midi filter columns for lysate recovery	50	740607
Disposable 5 mL syringe	For lysate recovery	100	729101
Accessories for direct eDNA precipitation from water			
Buffer PREC	Precipitation buffer for direct precipitation method	50 mL	740568
Optional accessories			
MN Bead Tube Holder 5 mL	For convenient lysis	1	740459
NucleoSpin® Inhibitor Removal	For clean-up of contaminated and discolored DNA eluates - Columns, Collection Tubes (1.5 mL and 2 mL), buffers	10 / 50	740408.10 / 50

www.mn-net.com

MACHEREY-NAGEL

MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6–8 · 52355 Düren · Germany

DE / International:
Tel.: +49 24 21 969-0
Fax: +49 24 21 969-199
E-mail: info@mn-net.com

CH:
Tel.: +41 62 388 55 00
Fax: +41 62 388 55 05
E-mail: sales-ch@mn-net.com

FR:
Tel.: +33 388 68 22 68
Fax: +33 388 51 76 88
E-mail: sales-fr@mn-net.com

US:
Tel.: +1 484 821 0984
Fax: +1 484 821 1272
E-Mail: sales-us@mn-net.com

Bioanalysis

MACHEREY-NAGEL

NucleoMag® DNA Microbiome

Isolation of DNA from soil, stool and biofilms

Automation friendly solution for microbiome samples

- High DNA yields – superior downstream performance
- Patent pending inhibitor removal technology
- Sample disruption with MN Bead Tubes or Plates

Isolation of DNA from soil, stool and biofilms

NucleoMag® DNA Microbiome

Microbial communities inside and outside of our bodies define and modulate human health. Moreover, the microbiome of the soil and biofilm around us plays a substantial role for ecosystem health.

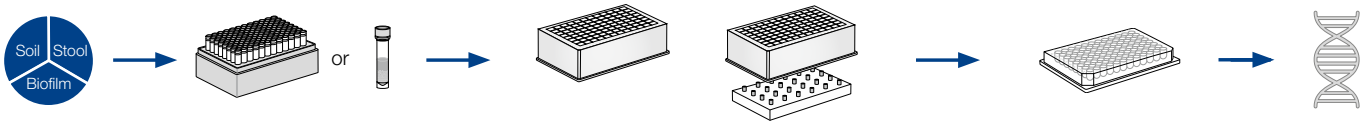
The NucleoMag® DNA Microbiome kit enables high throughput, automation friendly isolation of microbial DNA from samples typically used for microbiome analysis, including soil, stool and biofilm.

The most common challenges in microbiome sample preparations are sample lysis and presence of PCR inhibitors. The use of MN Bead Tubes or MN 96 Bead Plates ensures a uniform and efficient sample disruption and optimal DNA yields. MACHEREY-NAGEL's proprietary inhibitor removal technology removes PCR inhibitors even from challenging soil and fecal samples.

Product at a glance

	NucleoMag® DNA Microbiome
Technology	Magnetic beads
Processing	Manual or automated
Sample material	soil, stool, biofilms (swabs)
Sample amount	50–200 mg
Elution volume	50–100 µL
Preparation time	30 min on KingFisher™ Flex (excl. sample lysis)

Purification workflow



Sample — Lysis — Bind, wash — Elute — DNA

Options for sample disruption

MN Bead Tubes Type A

- 2 mL screw cap tubes
- Prefilled with 0.6 – 0.8 mm ceramic beads
- Compatible with common bead beating devices

MN Bead Plate Type A

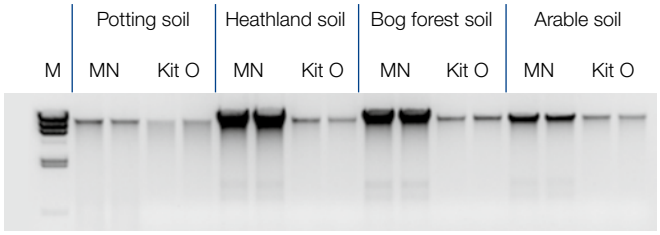
- Rack of prefilled tube strips (8 x 12)
- Prefilled with 0.6 – 0.8 mm ceramic beads
- Compatible with common plate disruption device

Single bead tubes or bead plates – Freedom of choice for processing microbiome samples

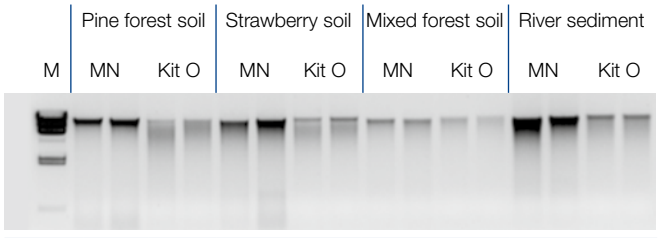
For optimal DNA yields, a complete disruption of sample material is necessary and can be performed with e.g., MN Bead Tubes Type A or MN 96 Bead Plates Type A. These accessories contain ceramic beads, resulting in efficient disruption of microbial cells in soil, stool and other materials used for microbiome analysis.

Isolation of DNA from soil, stool and biofilms

Application data



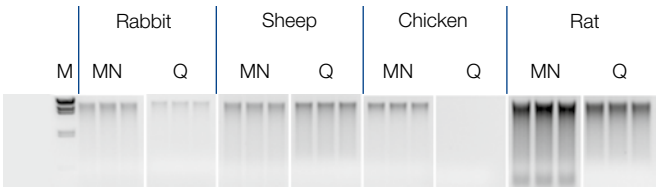
Kit	MN	O	MN	O	MN	O	MN	O
$A_{260/280}$	1.65	1.40	1.53	1.37	1.85	1.71	1.68	1.74
$A_{260/230}$	1.18	1.00	1.32	0.90	1.76	1.11	1.30	1.08
DNA yield (µg)	0.96	0.55	4.15	0.50	4.75	0.40	1.35	0.40
qPCR C_T (1:10 dil)	18.08	18.23	15.22	18.76	15.91	18.78	17.54	19.22



Kit	MN	O	MN	O	MN	O	MN	O
$A_{260/280}$	1.73	1.73	1.81	1.68	1.65	1.55	1.71	1.66
$A_{260/230}$	1.38	1.24	1.53	1.16	1.10	0.95	1.45	1.19
DNA yield (µg)	1.20	0.70	1.45	0.55	0.50	0.30	1.30	0.50
qPCR C_T (1:10 dil)	17.68	17.81	16.76	17.74	18.53	19.63	16.59	17.97

Efficient isolation of DNA from soil microorganisms

Soil samples were subjected to a mechanical lysis procedure with MN Bead Tubes Type A. DNA was purified from the homogenates using the NucleoMag® DNA Microbiome kit (MN) and a competitor kit (O) according to the manufacturers instructions. DNA yield and purity were measured photometrically. DNA eluates were dilutet 1:10 and used in a qPCR for the bacterial 16s rRNA gene. The NucleoMag® DNA Microbiome kit preocedure resulted in higher yields, better purities and a better qPCR performance for all soil samples tested.



Kit	MN	Q	MN	Q	MN	Q	MN	Q
$A_{260/280}$	1.59	1.73	1.53	1.61	1.55	1.47	1.78	1.49
$A_{260/230}$	1.25	0.85	1.05	0.86	1.05	0.62	1.20	0.73
DNA yield (µg)	1.17	1.00	1.00	1.83	0.8	–	3.77	2.77
qPCR C_T	11.97	11.98	11.87	11.94	12.55	19.96	12.51	12.41

Efficient isolation of DNA from fecal samples

Fecal samples from different animals (rabbit, sheep, chicke, rat) were subjected to a mechanical lysis procedure with MN Bead Tubes Type A. DNA was purified from the homogenates using the NucleoMag® DNA Microbiome kit (MN) and a competitor kit (Q) according to the manufacturers instructions. DNA yield and purity were measured photometrically. DNA eluates were used in a qPCR for the bacterial 16s rRNA gene. DNA eluates obtained with NucleoMag® DNA Microbiome show a superior purity for all fecal sample types. The yield is comparable (sheep) or better (rabbit, chicken, rat) than with the competitor kit. The qpCR performance is comparable (rabbit, sheep, rat) or better (chicken) than with the competitor kit.

Isolation of DNA from soil, stool and biofilms

Ordering information

Product	Specifications	Pack of	REF
NucleoMag® DNA Microbiome	Magnetic bead based kit for the purification of microbial DNA from bacteria or yeast; contains NucleoMag® B-Beads, buffers	1 x 96 preps	744330.1
		4 x 96 preps	744330.4
MN Bead Tubes Type A	2 mL screw cap micro tubes prefilled with 0.6–0.8 mm ceramic beads; recommended for soil, stool and biofilm samples.	50	740786.50
MN 96 Bead Plate Type A	Rack of prefilled tube strips (12 strips with 8 tubes each) containing 0.6–0.8 mm ceramic beads; suitable in conjunction with mixer mill; recommended for soil, stool and biofilm samples.	4 x 96 preps	740850.4
		24 x 96 preps	740850.24

KATEN300219 NucleoMag DNA Microbiome en1 / 1 / 0 / 09.2020 Druckerei : Printed in Germany

www.mn-net.com

MACHEREY-NAGEL

Management System EN ISO 13485:2016 ISO 9001:2015 TÜVRheinland ZERTIFIZIERT www.tuv.com ID 9000008338

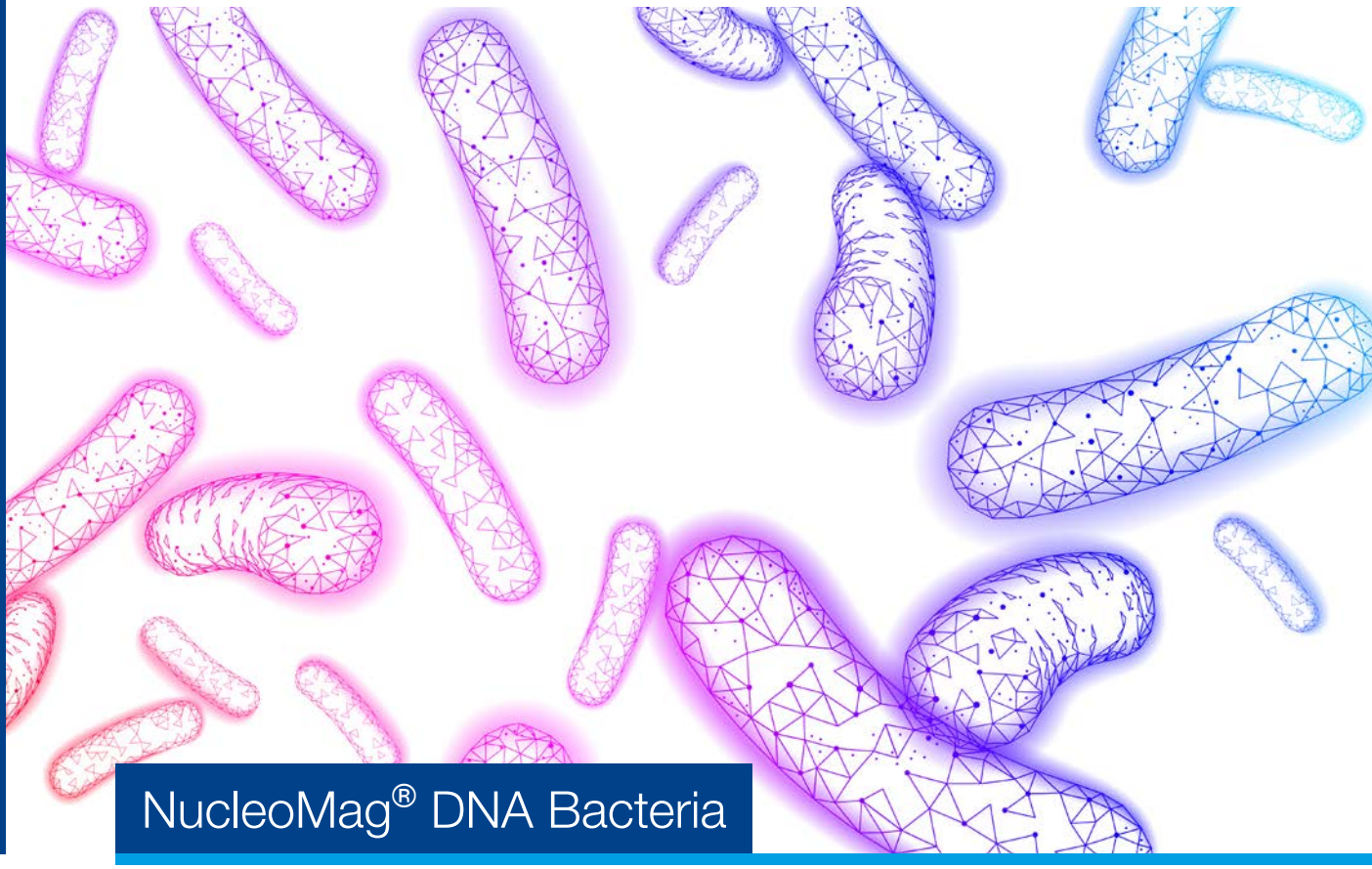
MACHEREY-NAGEL GmbH & Co. KG
Neumann-Neander-Str. 6–8
52355 Düren · Deutschland

DE Tel.: +49 24 21 969-0 info@mn-net.com
CH Tel.: +41 62 388 55 00 sales-ch@mn-net.com
FR Tel.: +33 388 68 22 68 sales-fr@mn-net.com
US Tel.: +1 484 821 0984 sales-us@mn-net.com

Bioanalysis

MACHEREY-NAGEL

High throughput DNA isolation from bacteria and yeast



NucleoMag® DNA Bacteria

Automation friendly solution for microbial samples

- Environmentally sustainable buffer chemistry – no chaotropic salts
- Combine with MN Bead Tubes for single sample processing or MN 96 Bead Plates for high throughput sample disruption
- Liquid Proteinase K and Liquid RNase A for easy handling

High throughput DNA isolation from bacteria and yeast

NucleoMag® DNA Bacteria

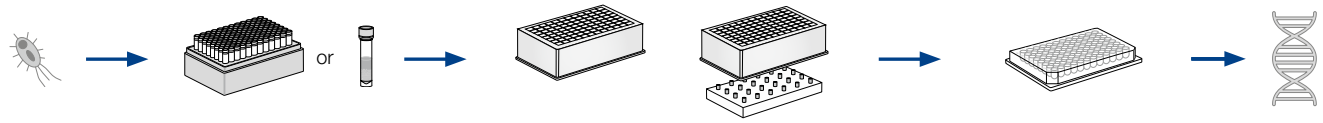
The NucleoMag® DNA Bacteria kit enables high throughput, automation friendly isolation of DNA from diverse microbial samples. The kit is optimal for cultured Gram-positive and Gram-negative bacteria, yeast, and spores. Typical samples include cultures of commercially relevant microorganisms (e.g., food research, chemicals production, ethanol production for sustainable energy), clinically relevant organisms as well as microbial cultures in basic research. Typical downstream applications include PCR, qPCR, and NGS. Support protocols are also provided for DNA extraction from hard shelled organisms such as insects and crustaceans as well as lipid rich and fungal samples.

NucleoMag® DNA Bacteria utilizes a powerful yet environmentally friendly buffer chemistry, free of chaotropic salts as well as any dangerous goods (patent pending). The kit can be combined with MN Bead Tubes or MN 96 Bead Plates for mechanical disruption.

Product at a glance

	Mag NucleoMag® DNA Bacteria
Technology	Magnetic bead technology
Processing	Manual or automated
Sample material	Microbial cell culture pellets of Gram-positive and Gram-negative bacteria, and yeasts.
Sample amount	Up to approx. 40 mg wet weight
Elution volume	50–200 µL
Preparation time	30 min for KingFisher® Flex (excl. sample lysis)
Theoretical binding capacity	0.4 µg/µL beads

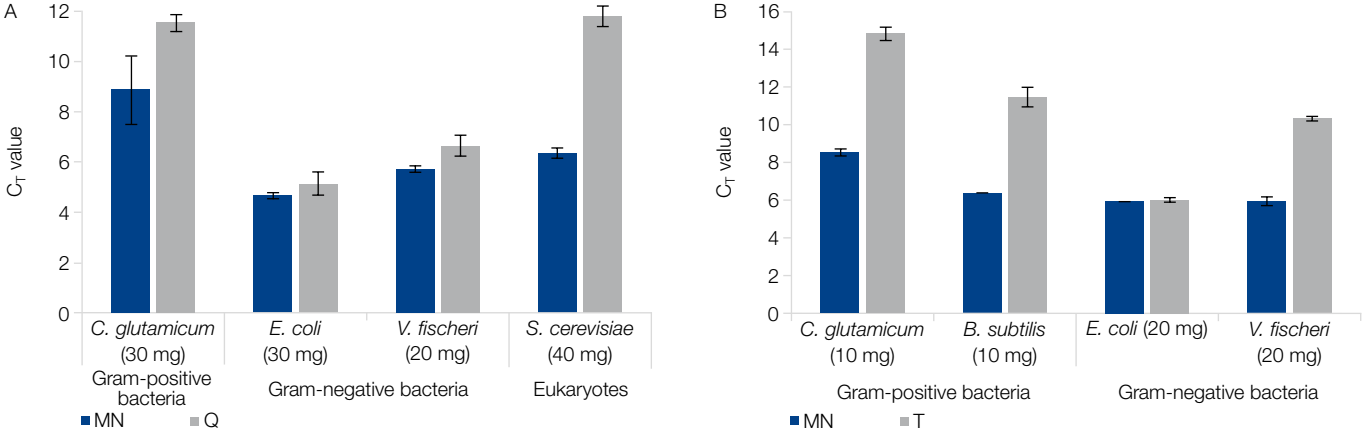
Procedure



Microbial cultures | Disruption, lysis | Bind, wash | Elute | DNA

For optimal DNA yields, a complete disruption of sample material is necessary and can be performed with e.g., MN Bead Tubes or MN 96 Bead Plates. After sample disruption, Binding Buffer IMB and the NucleoMag® B-Beads are added to the transferred lysate. Subsequent to the magnetic separation, the NucleoMag® B-Beads are washed to remove contaminants and salts using Wash Buffer IMW and 80 % ethanol (600 µL each), respectively. After air drying the NucleoMag® B-Beads for 10 min at RT, the DNA is finally eluted with Elution Buffer IME (50–200 µL). The NucleoMag® DNA Bacteria kit can be used either manually or automated on standard liquid handling instruments and automated magnetic separators.

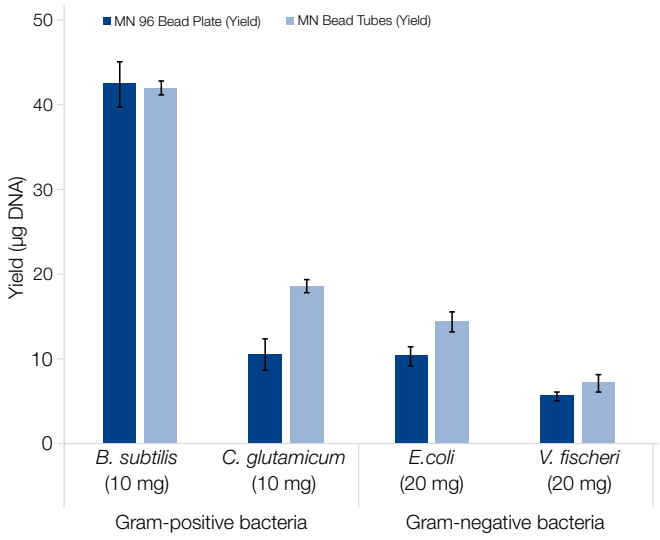
Application data



Competitive detection of microbial DNA

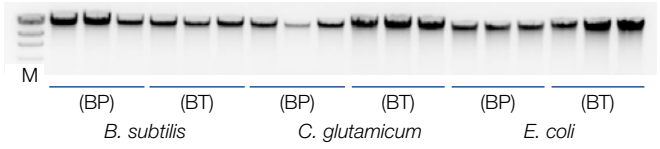
DNA was isolated from Gram-positive and Gram-negative bacteria as well as yeast using the NucleoMag® DNA Bacteria kit (MN, blue bars) in comparison to competitor kits Q and T (grey bars). All procedures were performed according to manufacturer's recommendations. In comparison to competitors Q (figure A) and T (figure B) the PCR results show significantly earlier amplification (lower C_T values), demonstrating superior extraction of microbial DNA. The qPCR was performed for 16s rRNA and 18s rRNA for bacteria and yeast, respectively, using the Maxima SYBR® Green kit from Thermo Scientific on Applied Biosystems® 7500 Real-Time PCR System.

High throughput DNA isolation from bacteria and yeast



Efficient DNA extraction with both bead plate and single tube homogenization

DNA was isolated from various Gram-positive and Gram-negative bacteria using the NucleoMag® DNA Bacteria kit in combination with different solutions for sample homogenization and DNA yields were determined by UV spectrometry. The samples were homogenized by using either racks of prefilled tube strips (MN 96 Bead Plates) or single bead tubes (MN Bead Tubes). The results for samples homogenized with MN 96 Bead Plates (dark blue bars) were comparable to the results obtained with homogenization in the MN Bead Tubes (light blue bars).



Reliable DNA integrity with bead plate or single bead tube homogenization

DNA was isolated from various insects (A) and Gram-positive and Gram-negative bacteria (B) using the NucleoMag® DNA Bacteria kit. The samples were simultaneously homogenized by using either a rack of prefilled tube strips (BP = MN 96 Bead Plate) or single bead tubes (BT = MN Bead Tubes). Both homogenization systems enable a reliable DNA extraction in combination with the NucleoMag® DNA Bacteria kit.

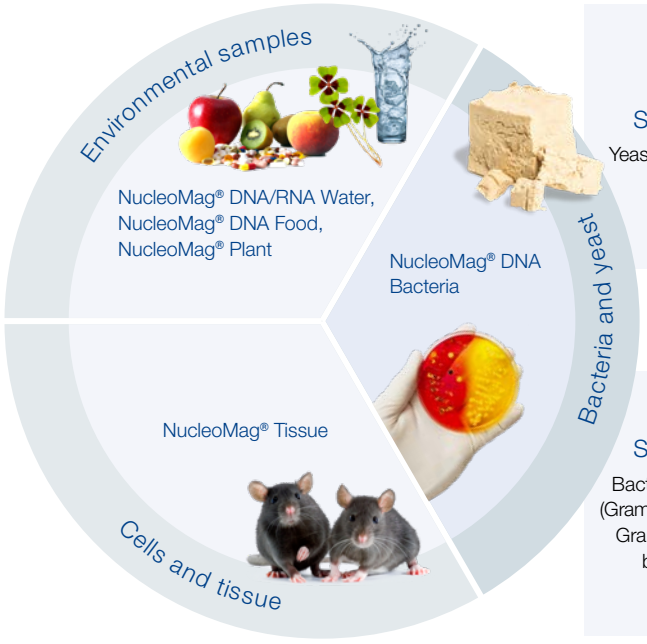
Category	Tested sample material
Bacteria	*E. coli*, *B. subtilis*, *C. glutamicum*, *V. fischeri*
Yeast	Yeast (*S. cerevisiae*), bread mold (*R. stolonifer*)*, melon mold*
Insects and crustacea*	Mealworm (*T. molitor*), fruit fly (*D. melanogaster*), freshwater shrimp (*D. pulex*), honey bees, cockroaches, Isopods, house cricket juveniles (*A. domesticus*), firebrat (*T. domestica*), shrimps, field cricket (*G. assimilis*), mosquitos, mosquito larvae (*Anopheles spec.*)
Fatty tissue*	Mouse brain, mouse testicles (*M. musculus*), atlantic salmon (*S. salar*), river trout (*S. trutta fario*)

*Support protocol available. Please contact technical service.

Overview of successfully tested sample materials

The NucleoMag® DNA Bacteria kit has been evaluated with several different sample types and species. Successful DNA isolation was verified via agarose gel electrophoresis or qPCR.

High throughput DNA isolation from bacteria and yeast



Samples
Yeast cell pellets

Homogenization (yeast)

MN Bead Tube Type A
- 2 mL screw cap micro tubes
- Prefilled with 0.6–0.8 mm ceramic beads

Samples
Bacterial pellets (Gram-positive and Gram-negative bacteria)

Homogenization (bacteria)

MN Bead Tube Type B
- 2 mL screw cap micro tubes
- Prefilled with 40–400 µm glass beads

MN 96 Bead Plate Type B
- Rack of prefilled tube strips (8 x 12)
- Prefilled with 40–400 µm glass beads

Single bead tubes or bead plates – Freedom of choice for processing challenging samples

The NucleoMag® DNA Bacteria kit is capable of purifying DNA from highly diverse samples, which pose a challenge for standard magnetic beads based kits. For efficient sample processing, the kit can be combined with sample homogenization in single bead tubes (MN Bead Tubes) or bead plates (MN 96 Bead Plates). The choice of bead beating material should be further adjusted according to the particular sample. For standard samples MN Bead Tubes Type A or B or MN 96 Bead Plate Type B should be used (see above). For optimal disruption of challenging tissue samples, such as insects and other arthropods as well as lipid rich vertebrate tissues, we recommend using MN Bead Tubes Type D or MN 96 Bead Plate Type D containing 3 mm steel beads (see ordering information).

Ordering information

Product	Specifications	Pack of (preps)	REF
NucleoMag® DNA Bacteria	Magnetic bead based kit for the purification of genomic DNA from bacteria or yeast. Containing NucleoMag® B-Beads, Elution Plate U-bottom, buffers, Liquid Proteinase K, Liquid RNase A	1 x 96 / 4 x 96	744310.1 / .4
MN Bead Tubes Type A	2 mL screw cap micro tubes prefilled with 0.6–0.8 mm ceramic beads, recommended for yeast samples.	50	740786.50
MN Bead Tubes Type B	2 mL screw cap micro tubes prefilled with 40–400 µm glass beads, recommended for Gram-positive and -negative bacteria	50	740812.50
MN Bead Tubes Type D	2 mL screw cap micro tubes prefilled with 3 mm steel beads, recommended for insects, crustaceans and lipid rich samples	50	740814.50
MN 96 Bead Plate Type B	Rack of prefilled tube strips (12 strips with 8 tubes each) containing 40–400 µm glass beads. Suitable in conjunction with mixer mill. Recommended for Gram-positive and -negative bacteria	4 / 24	740851.4 / .24
MN 96 Bead Plate Type D	Rack of prefilled tube strips (12 strips with 8 tubes each) containing 3 mm steel beads. Suitable in conjunction with mixer mill. Recommended for insects, crustaceans and lipid rich samples	4 / 24	740853.4 / .24
Square-well Blocks	96-well blocks with square wells for use with NucleoMag® SEP	4 / 24	740481 / .24
NucleoMag® SEP	Magnetic separator, for use with 96-well plates	1	744900

KATEN300216 NucleoMagDNABacteria en1 / 2 / 0 / 11.2019 PD · Printed in Germany

www.mn-net.com

MACHEREY-NAGEL

MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6–8 · 52355 Düren · Germany

DE / International:
Tel.: +49 24 21 969-0
Fax: +49 24 21 969-199
E-mail: info@mn-net.com

CH:
Tel.: +41 62 388 55 00
Fax: +41 62 388 55 05
E-mail: sales-ch@mn-net.com

FR:
Tel.: +33 388 68 22 68
Fax: +33 388 51 76 88
E-mail: sales-fr@mn-net.com

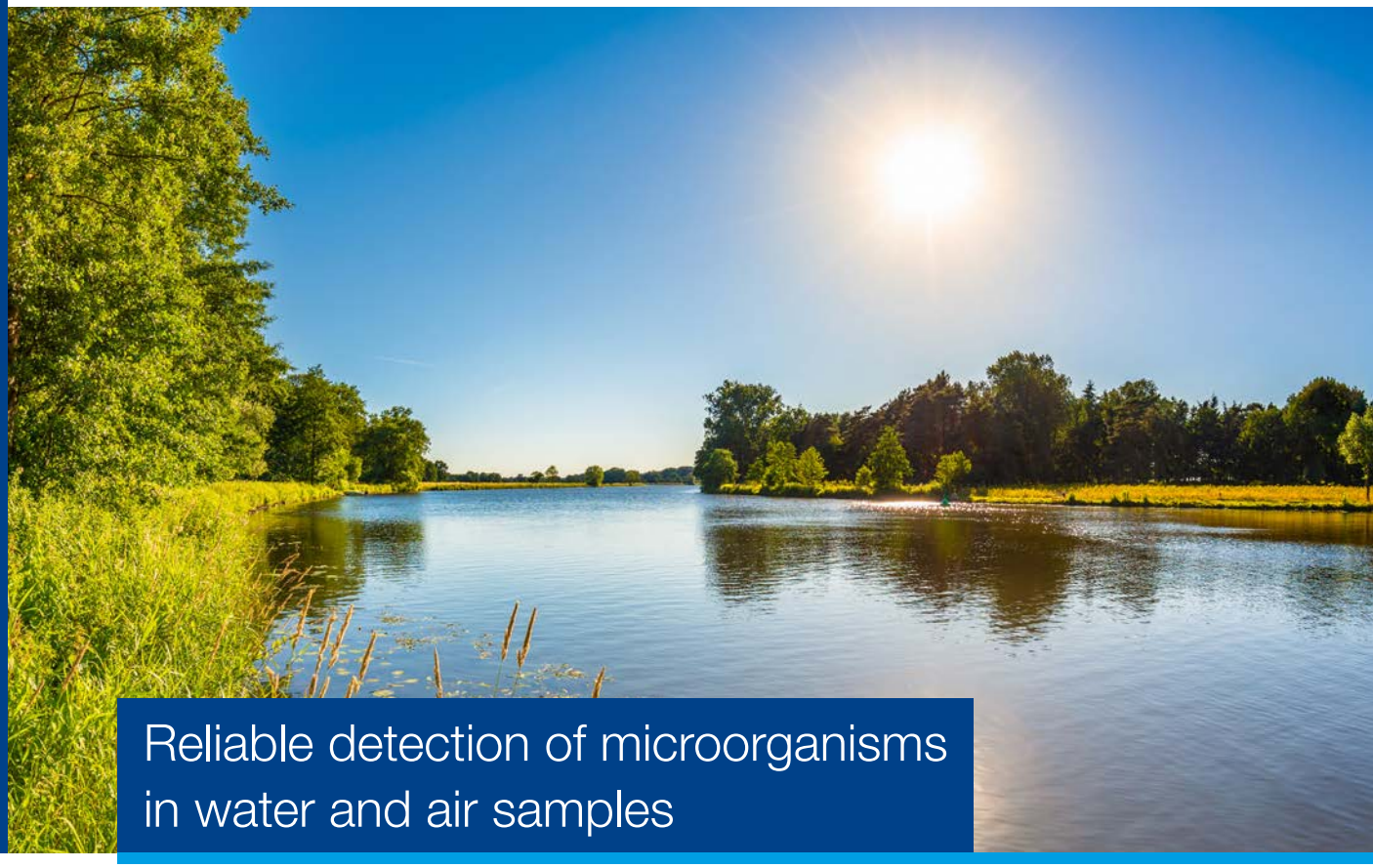
US:
Tel.: +1 484 821 0984
Fax: +1 484 821 1272
E-mail: sales-us@mn-net.com

MN Since 1911

Bioanalysis

MACHEREY-NAGEL

NucleoMag® DNA/RNA Water



Reliable detection of microorganisms in water and air samples

- Fast isolation of microbial DNA and RNA from filtered samples
- Minimized downstream inhibition for reliable results
- Automation friendly

DNA and RNA purification from water and air

Microbial nucleic acids from water and air

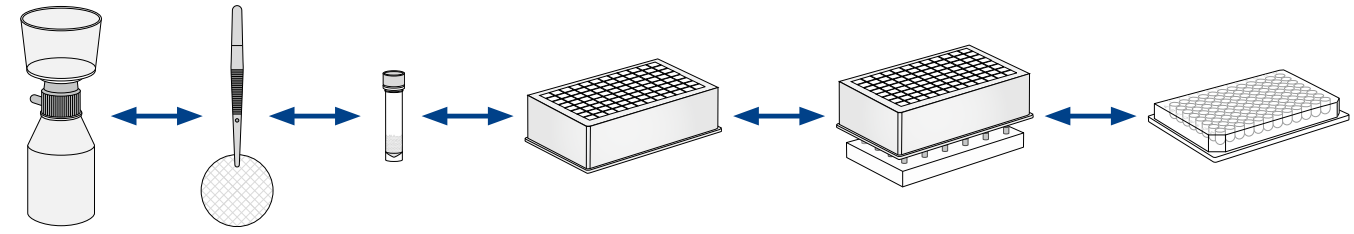
The new NucleoMag® DNA/RNA Water enables manual or automated detection of either DNA, RNA, or both molecules in parallel from a range of water samples, spanning from turbid to clear, as well as from air filters. Simultaneous detection of DNA and RNA in the same sample enables fast and accurate determination of presence of total microbes (through DNA) and living microorganisms (through RNA) in the same sample.

NucleoMag® DNA/RNA is compatible with a variety of filters and filtration systems, including conventional round filters (e. g., 25 mm to 47 mm) from various materials as well as with cartridge filters (such as Sterivex™). This makes NucleoMag® DNA/RNA Water ideal for microbial metagenomics, environmental microbiology as well as for estimation of water quality through determination of the microbial load of the sample.

Product at a glance

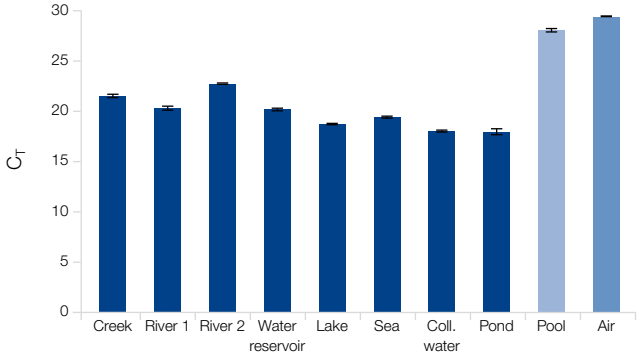
	NucleoMag® DNA/RNA Water
Technology	Magnetic beads
Format	Highly reactive superparamagnetic beads
Processing	Manual or automated
Sample material	Water or air samples
Maximum amount of starting material	10–1000 mL per preparation
Fragment size	300 bp–approx. 50 kbp
Elution volume	50–200 µL
Preparation time	40 min for KingFisher® Flex (excl. filtration and sample lysis)
Theoretical binding capacity*	0.4 µg/µL beads

Procedure



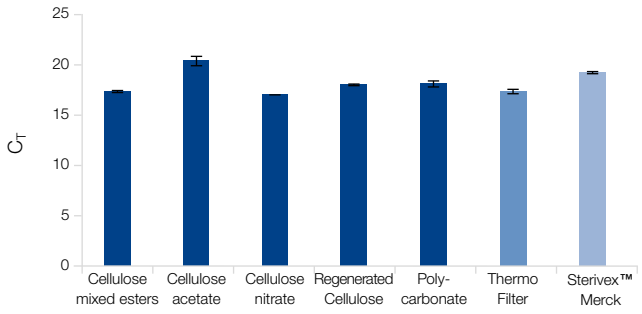
Filter the water sample · Transfer the filter · Homogenize the filter · Transfer lysate · Bind-wash-elute · Pure nucleic acid

Application data



Efficient detection for different water and air samples

Various water samples and an air sample were filtered and the extracted DNA was analyzed by PCR. Microbial DNA could be efficiently measured for all of the samples, demonstrating the versatility of the NucleoMag® DNA/RNA Water kit.



Compatibility with different filtration systems

A qPCR was performed with nucleic acids isolated from round filters and a filtration cartridge system, demonstrating reliable results across different filtration systems.

Ordering information

Specification	Pack of	REF
NucleoMag® DNA/RNA Water	1 × 96 / 4 × 96 preps	744220.1 / .4
NucleoSpin® Bead Tubes Type A	50 preps	740786.50
NucleoSpin® Bead Tubes Type A 5 mL	50 preps	740799.50
MN Bead Tube Holder	1	740469
MN Bead Tube Holder 5 mL	1	740459

© John Smith – fotolia.com
KATEN300209 Flyer NucleoMag® DNA-RNA Water Kit en1 / 2 / 0 / 04.2019 DD · Printed in Germany

www.mn-net.com

MACHEREY-NAGEL

MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6–8 · 52355 Düren · Germany

DE / International:
Tel.: +49 24 21 969-0
Fax: +49 24 21 969-199
E-mail: info@mn-net.com

CH:
Tel.: +41 62 388 55 00
Fax: +41 62 388 55 05
E-mail: sales-ch@mn-net.com

FR:
Tel.: +33 388 68 22 68
Fax: +33 388 51 76 88
E-mail: sales-fr@mn-net.com

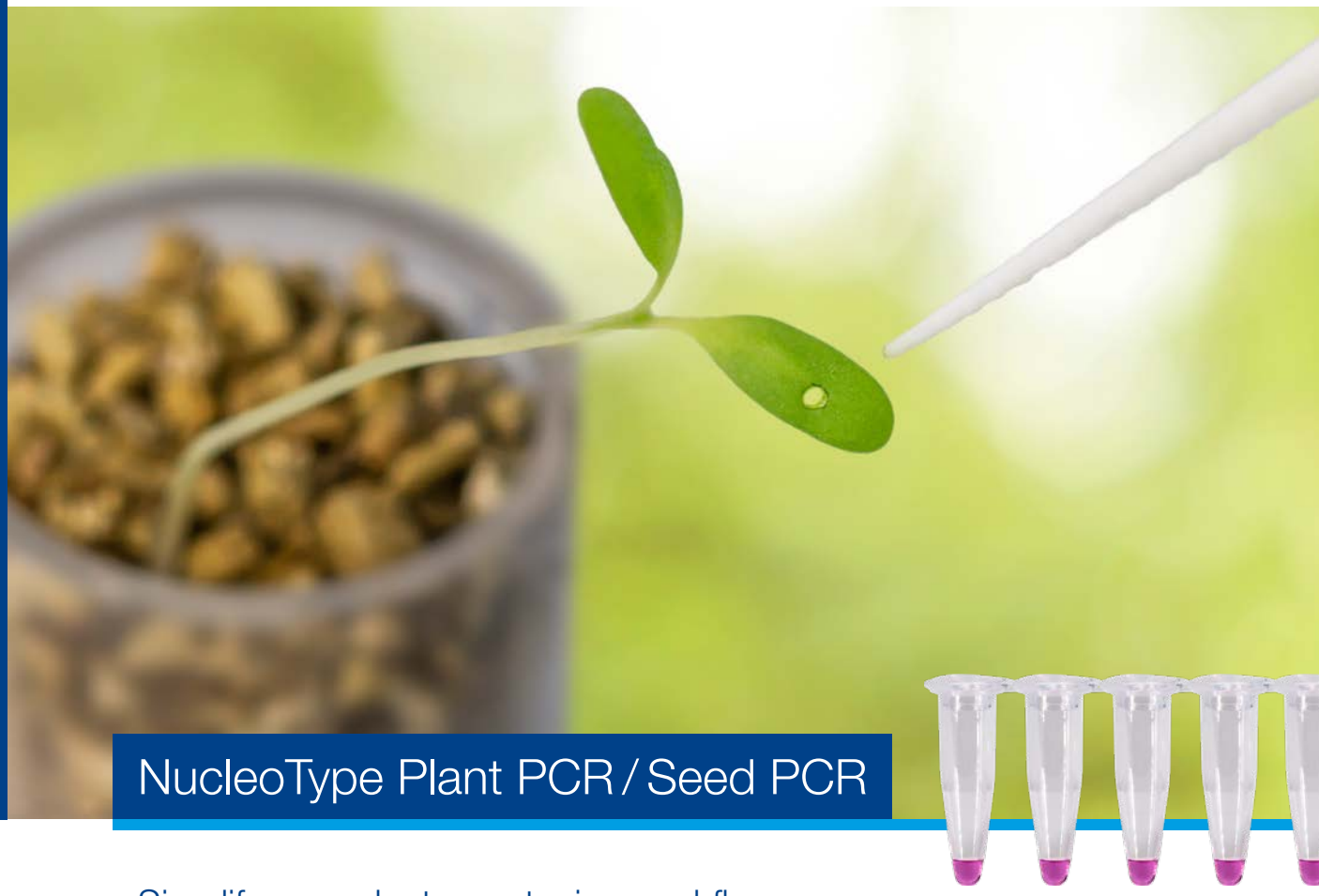
US:
Tel.: +1 484 821 0984
Fax: +1 484 821 1272
E-Mail: sales-us@mn-net.com

MN Since 1911

Bioanalysis

MACHEREY-NAGEL

Direct PCR from plant leaf and seed samples



NucleoType Plant PCR / Seed PCR

Simplify your plant genotyping workflow

- Patent pending plant sample transfer for superior PCR results
- Seed processing in less than 5 minutes
- Ready to go NucleoType HotStart PCR Master Mix included

PCR amplification from plant samples

NucleoType Plant PCR

Simplify your plant genotyping workflow

The NucleoType Plant PCR is designed for rapid plant typing experiments without the need for DNA purification. The kits enable a fast and convenient transfer of plant sample material directly into the ready to go HotStart PCR Master Mix. Tedious plant tissue sample collection such as leaf disc punching is not necessary. To harvest plant tissue the patent pending Plant Transfer Tool (PTT) just needs to be pierced in or through the leaf or petal tissue, followed by dipping the tool into the PCR Mix. The special coating of the PTT inactivates PCR inhibitors present in many plant materials to a considerably extend during sample transfer. After sample transfer, it is possible to store the PCR Mix for up to 2 hours at +4°C to +37°C before starting the cycling, admitting enought time to return from the growing site to the lab.

Hold bigger plant leaves easily by hand

For difficult to grasp plant leaves just take any supportive pad (not included)

Use the gripping tool of the PTT for small or hard to access plant leaves

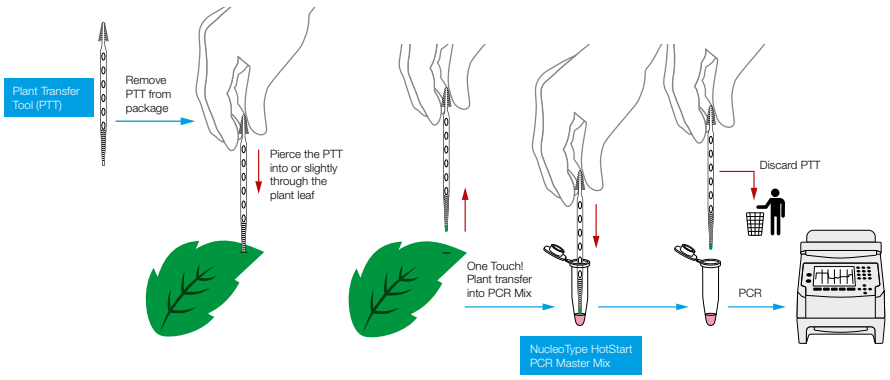
Product at a glance

PCR

NucleoType Plant PCR

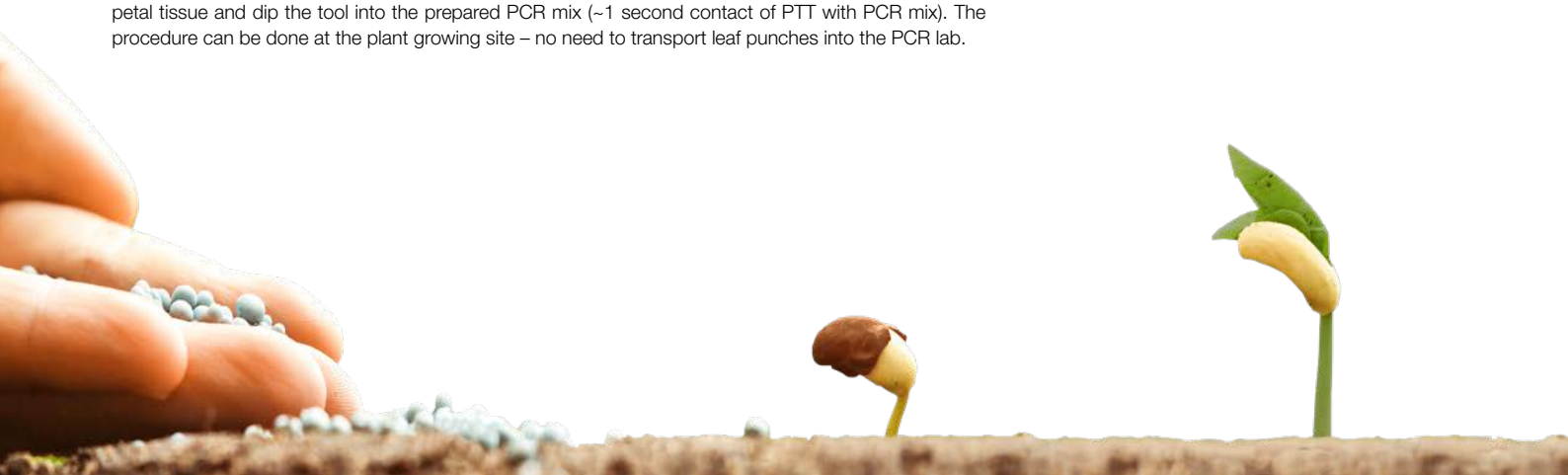
Technology	Direct PCR: Transfer of plant leaf aliquot with Plant Transfer Tool (PTT) directly into PCR mix
Format	10 µL PCR (optional up to 50 µL)
Sample type	Plant leaf material from e.g., corn, soybean, wheat, Arabidopsis, tobacco, cotton, grape wine, cress, as well as from kiwi, banana, and avocado fruit flesh
Preparation time	Sample preparation: < 1 min; PCR cycling: 30–90 min (cycler and target size dependent)
Amplicon size	Up to 1000 bp
Fragment size	> 300 bp–approx. 50 kbp; depending on sample processing
Analysis	Gel electrophoresis: Approx. 30 min (40 samples); Bioanalyzer®: Approx. 40 min (12 samples)

Procedure



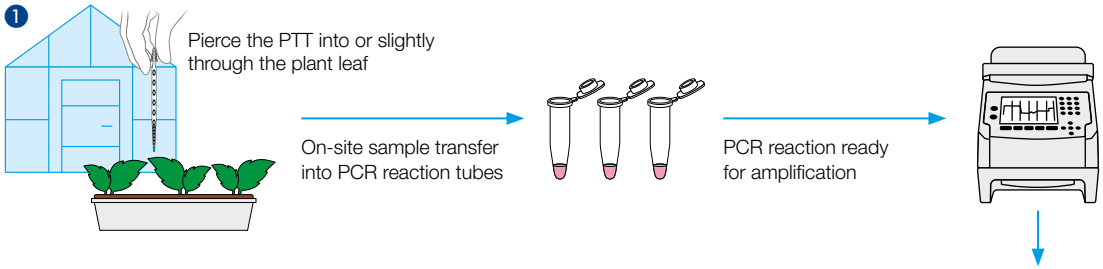
Sample processing

Sample uptake, interaction with coated reactive substance on the Plant Transfer Tool (PTT) and transfer into PCR reaction mix requires less than 5 seconds. Just pierce the PTT into or throught the leaf or petal tissue and dip the tool into the prepared PCR mix (~1 second contact of PTT with PCR mix). The procedure can be done at the plant growing site – no need to transport leaf punches into the PCR lab.



PCR amplification from plant samples

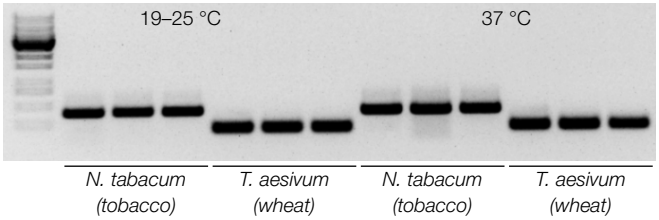
Application data

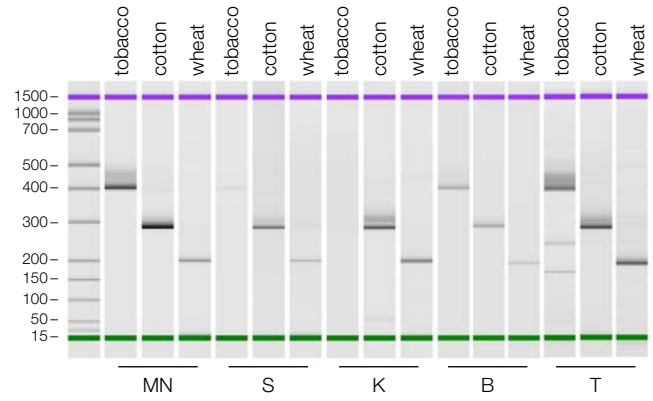


Take the lab to your greenhouse – On site sample transfer

Challenging plant samples derived from e.g. tobacco or wheat leaf were processed with the NucleoType Plant PCR kit utilizing the Plant Transfer Tool. The data demonstrate, that plant sample material can be obtained and transferred into the PCR at the plant growing site (1) and that there is up to 2 h time to return to the lab before starting the PCR cycling (see picture 2). Alternatively, PTT with adhering plant material can be stored for up to two hours and transported to the lab before dipping into the PCR (data not shown).

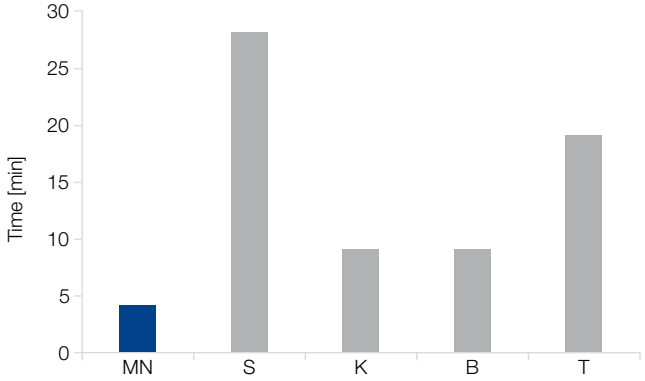
2 PCR after 2 h reaction tube storage at:





Highly specific amplification with the NucleoType Plant PCR kit

The NucleoType Plant PCR kit (MN) was used to analyze plant leaves from tobacco, cotton, and wheat in comparison to diverse competitors (processed according to manufacturer's recommendations). PCR was performed by amplification of a 422 bp fragment (tobacco), 308 bp fragment (cotton) and a 201 bp fragment (wheat). The Bioanalyzer® results demonstrate a higher specificity with less undesired amplifications in comparison to the competitor kits from S, T, K, B.



Reliable and fast sample preparation without the risk of cross contamination

The preparation time (4 PCR reactions with 3 different primer pairs) from sample uptake, to the start of PCR cycling is efficiently reduced due to the disposable Plant Transfer Tool (PTT). The NucleoType Plant PCR kit (MN) is one of the fastest genotyping kits on the market and in comparison to the competitor kits (S, T, K, B) there is no need for time consuming decontamination / cleaning of puncher/scalpel or sample lysis.

PCR amplification from seed samples

NucleoType Seed PCR

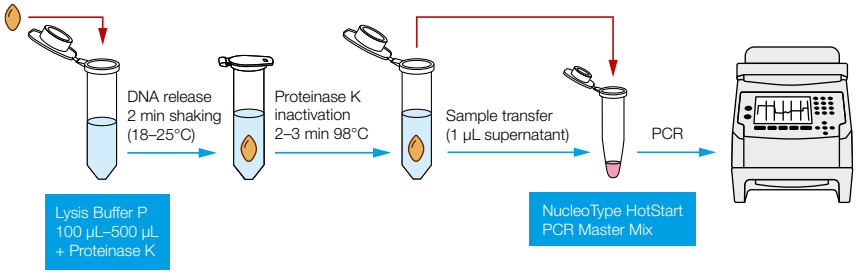
Speed up your seed genotyping workflow

DNA purification from whole or ground seed material is a time consuming and elaborate process. The NucleoType Seed PCR has been conceived for fast genotyping experiments without the need for DNA purification. For hard plant material, e.g. seeds, which hamper sample transfer with the Plant Transfer Tool (PTT), the NucleoType Seed PCR kit provides – instead of the PTT – the optimized Lysis Buffer P and Proteinase K for a simple sample preparation within a few minutes.

Product at a glance

	PCR NucleoType Seed PCR
Technology	Simple sample preparation suitable for hot start PCR
Format	10 µL PCR (optional up to 50 µL)
Sample type	Hard plant material like e.g., seeds from soybeen, wheat, corn, rice, as well as from moss, fern leaf, and fir needle
Preparation time	Sample preparation < 5 min; PCR cycling: 30–90 min (cycler and target size dependent)
Amplicon size	Up to 2000 bp
Analysis	Gel electrophoresis: Approx. 30 min (40 samples); Bioanalyzer®: Approx. 40 min (12 samples)

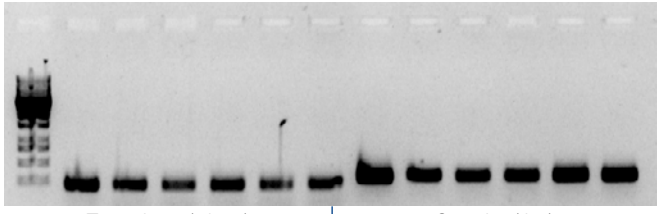
Procedure



Sample processing

The seed sample is placed into an adequate volume of Lysis Buffer P containing Proteinase K. After incubation of 2 min while shaking at room temperature (18–25°C), DNA is released. Subsequently the Proteinase K is deactivated at 98°C (2–3 min). Afterwards, 1 µL of template DNA (supernatant) is transferred into the PCR mix.

Application data



Seed sample genotyping

Seed samples (wheat and rice, n = 6) were placed into 100 µL Lysis Buffer P and incubated for 2 min while shaking at room temperature (18–25°C). After Proteinase K deactivation at 98°C (2–3 min), an aliquot of 1 µL template DNA was transferred into the PCR mix. A 201 bp fragment for wheat and a 308 bp for rice was amplified.

Ordering information

Product	Specifications	Preps	REF
NucleoType Plant PCR	Plant Transfer Tool (coated) for interaction with PCR inhibitors; NucleoType HotStart PCR Master mix (2x) containing polymerase, dNTPs, buffer, enhancer, loading dye and stabilizer	25 / 100 / 500	743202.25 / .100 / .500
NucleoType Seed PCR	Lysis Buffer P; Proteinase K; NucleoType HotStart PCR Master mix (2x) containing polymerase, dNTPs, buffer, enhancer, loading dye and stabilizer	25 / 100 / 500	743203.25 / .100 / .500

Bioanalyzer® is a registered trademark of Agilent Technologies, Inc..

KATEN300212 Flyer Nucleotype Seed PCR en1 / 2 / 0 / 07.2019 DD · Printed in Germany

www.mn-net.com

MACHEREY-NAGEL

MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6–8 · 52355 Düren · Germany

DE / International:
Tel.: +49 24 21 969-0
Fax: +49 24 21 969-199
E-mail: info@mn-net.com

CH:
Tel.: +41 62 388 55 00
Fax: +41 62 388 55 05
E-mail: sales-ch@mn-net.com

FR:
Tel.: +33 388 68 22 68
Fax: +33 388 51 76 88
E-mail: sales-fr@mn-net.com

US:
Tel.: +1 484 821 0984
Fax: +1 484 821 1272
E-mail: sales-us@mn-net.com

MN Since 1911