

MACHEREY-NAGEL

High throughput DNA isolation from bacteria and yeast

Bioanalysis



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

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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.

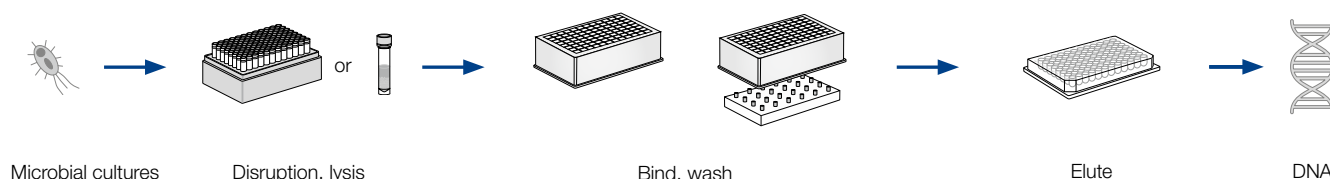
Product at a glance



NucleoMag® DNA Bacteria

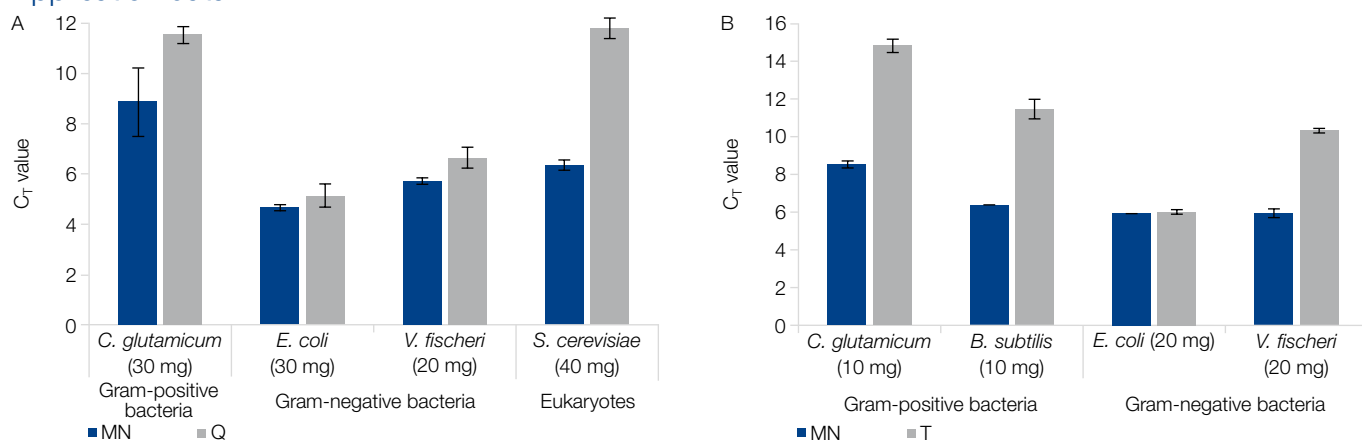
Technology	Magnetic bead technology
Processing	Manual or automated
Sample material	Microbial cell culture pellets of Gram-positive and Gram-negative bacteria, and yeasts.
Sample amount	Up to approx. 40 mg wet weight
Elution volume	50–200 µL
Preparation time	30 min for KingFisher® Flex (excl. sample lysis)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

Procedure



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.

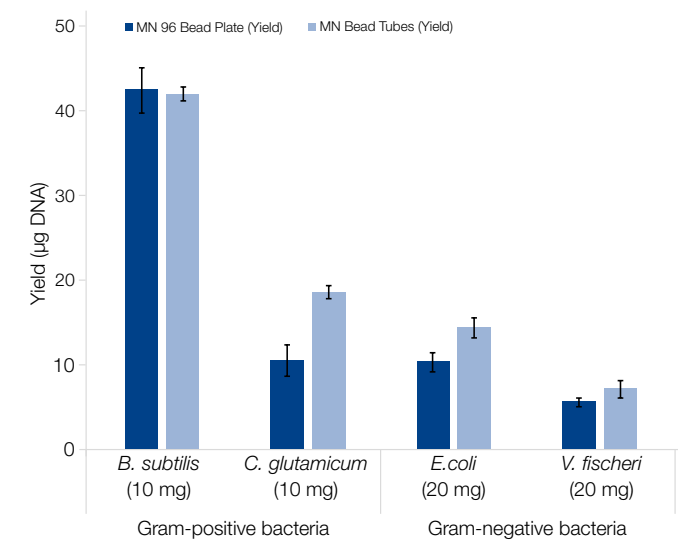
Application data



Competitive detection of microbial DNA

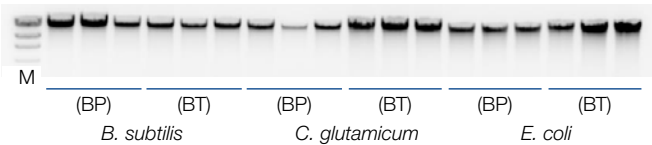
DNA was isolated from Gram-positive and Gram-negative bacteria as well as yeast using the NucleoMag® DNA Bacteria kit (MN, blue bars) in comparison to competitor kits Q and T (grey bars). All procedures were performed according to manufacturer's recommendations. In comparison to competitors Q (figure 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.

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

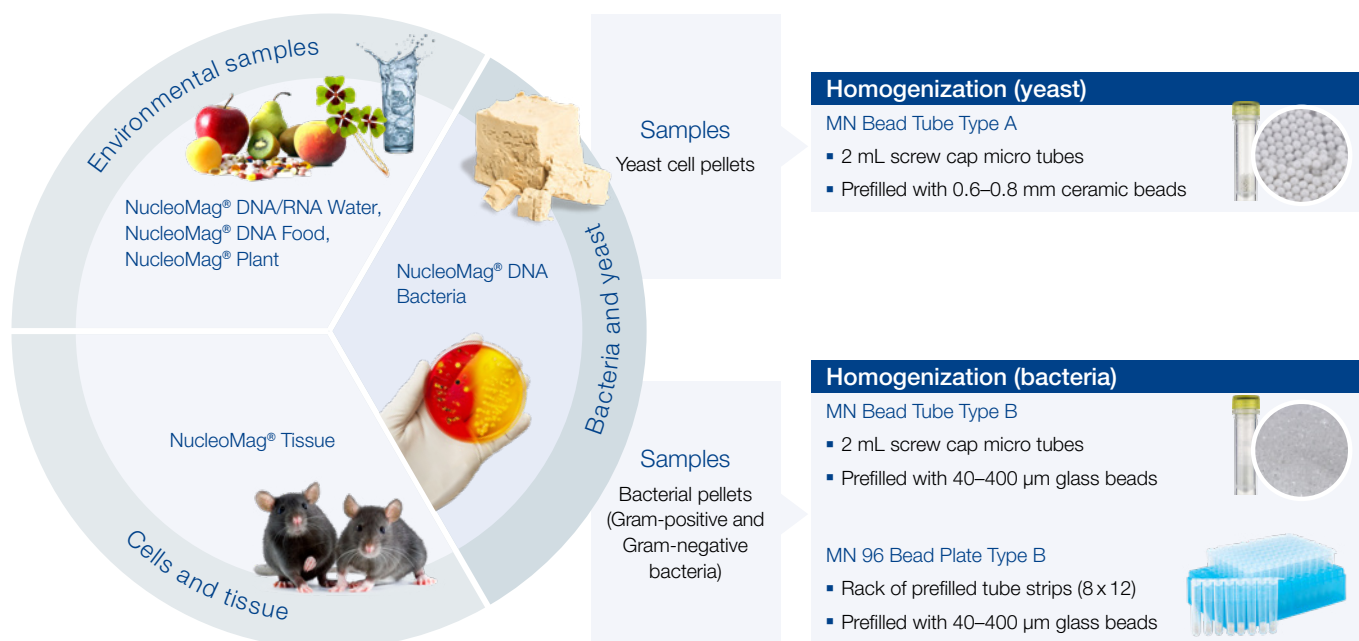
* Support protocol available. Please contact technical service.

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



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



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