MO BIO Laboratories, Inc.

中国总代理

深圳市安必胜科技有限公司

Kits for Isolation of DNA & RNA and PROTEIN Extraction

Tools for Molecular Biology Research

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SOIL

These kits use patented Inhibitor Removal Technology® (IRT) and bead beating technology to isolate microbial genomic DNA or RNA from all soil types and environmental samples including difficult types containing a high humic acid content such as compost, sediment, and manure.

		Starting Sample	Time Minutes	Binding Capacity	Bead/ Tube Type	Throughput	Cat #	
DNA	PowerSoil® DNA Isolation Kit	250 mg	30	Up to 20 µg per filter	0.7 mm Garnet/ 2 ml	LTP	12888-50 12888-100	page 10
DNA	PowerLyzer® PowerSoil® DNA Isolation Kit	250 mg	30	Up to 20 µg per filter	0.1 mm Glass/ 2 ml (tougher samples)	LTP	12855-50 12855-100	page 12
DNA	PowerMax® Soil DNA Isolation Kit	Up to 10 grams	30	Up to 1 mg per filter	0.7 mm Garnet/ 50 ml	LTP	12988-10	page 14
DNA	PowerSoil®-htp 96 Well Soil DNA Isolation Kit	250 mg	V	Up to 20 µg per filter	0.7 mm Garnet/ 96 well bead plate	HTP	12955-4 12955-12	page 11
DNA	PowerMag® Soil DNA Isolation Kit	250 mg	V	> 50 µg per reaction	0.7 mm Garnet/ 96 well bead plate	Automated HTP	27000-4-KF 27100-4-EP	page 15
RNA	RNA PowerSoil® Total RNA Isolation Kit	2 g	25	Up to 40 µg per filter	0.25 mm Carbide, 15 ml	LTP	12866-25	page 18

MICROBIAL

Kits designed to isolate high quality genomic DNA or RNA from microbial culture.

		Starting Sample	Time Minutes	Binding Capacity	Bead/ Tube Type	Throughput	Cat #	
DNA	UltraClean® Microbial DNA Isolation Kit	Microbial Culture	20	Up to 20 µg per filter	0.15 mm Garnet/ 0.5 ml	LTP	12224-50 12224-250	page 22
DNA	PowerLyzer® UltraClean® Microbial DNA Isolation Kit	Microbial Culture	20	Up to 20 µg per filter	0.1 mm Glass/ 0.5 ml	LTP	12255-50	page 24
DNA	BiOstic® Bacteremia DNA Isolation Kit	1.8 ml Cultured Blood	45	Up to 20 µg per filter	0.15 mm Garnet/ 2 ml	LTP	12240-50	page 54
DNA	PowerFood® Microbial DNA Isolation Kit	Cultured Food	55	Up to 20 µg per filter	0.15 mm Garnet/ 0.5 ml	LTP	21000-50 21000-100	page 25
DNA	PowerMag® Microbial DNA Isolation Kit	1.8 ml Cultured Blood	V	> 50 µg per reaction	0.1 mm glass/ 96 well bead plate	Automated HTP	27200-4	page 29
DNA	UltraClean® -htp 96 Well Microbial DNA Isolation Kit	1.8 ml Cultured Blood	90	Up to 20 µg per filter	0.1 mm Silica/ 96 well bead plate	HTP	10196-4 10196-12	page 22
RNA	UltraClean® Microbial RNA Isolation Kit	Microbial Culture	35	Up to 40 µg per filter	Silica Carbide /0.5 ml	LTP	15800-50	page 22

Note: Power kits use patented Inhibitor Removal Technology® (IRT). IRT removes inhibitory substances often contained in soil, water, stool, plants, seeds, biofilm and other sample types, resulting in pure nucleic acids ready to use in PCR, qPCR and next generation sequencing (NGS).

V: Time varies based on the platform used to run protocol, starting sample type and vacuum equipment
LTP: Low throughput (1-24 samples)
HTP: High throughput (96 well)

PLANTS & SEEDS

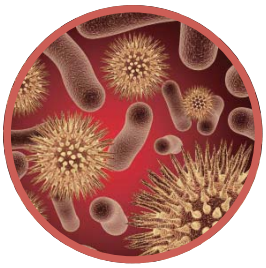
For fast and easy isolation of inhibitor-free genomic DNA or RNA from even the toughest plant and seed samples, including those high in polyphenols and polysaccharides. A unique Phenolic Separation Solution (PSS) is included as an optional step for samples high in polyphenolic compounds, such as pine and grape leaf. PSS breaks the bond between DNA and phenolics, preventing loss of DNA during the IRT step and increasing DNA yield.

		Starting Sample	Time Minutes	Binding Capacity	Bead/ Tube Type	Throughput	Cat #
DNA	PowerPlant® Pro DNA Isolation Kit	Up to 50 mg	30	Up to 20 µg per filter	2.38 mm Metal /2 ml	LTP	13400-50 page 31
DNA	PowerPlant® Pro -htp 96 Well DNA Isolation Kit	Up to 50 mg	V	Up to 20 µg per filter	2.38 mm Metal/ 96 well bead plate	HTP	13496-4 13496-BUNDLE (with Bead Plates)
DNA	PowerMag® Seed DNA Isolation Kit	25-50 mg	V	> 50 µg per reaction	3.2 mm Metal/ 96 well bead plate	Automated HTP	27700-4-KF page 33 27700-4-BUNDLE (with Bead Plates)
RNA	PowerPlant® RNA Isolation Kit	Up to 50 mg	30	Up to 40 µg per filter	2.38 mm Ceramic /2 ml	LTP	13500-50 13550-50 page 31 (with DNase)

BIOFILM

These kits pair a brand-new bead beating and cell lysis technology with our patented Inhibitor Removal Technology® (IRT) for increased yields of inhibitor free DNA from all types of biofilms, including microbial mats.

		Starting Sample	Time Minutes	Binding Capacity	Bead/ Tube Type	Throughput	Cat #
DNA	PowerBiofilm® DNA Isolation Kit	5-20 mg	25	Up to 20 µg per filter	2.8 mm Ceramic/ 0.5 mm Glass/ 0.1 mm Glass	LTP	24000-50 page 35
RNA	PowerBiofilm® RNA Isolation Kit	5-20 mg	45	Up to 40 µg per filter	2.8 mm Ceramic/ 0.5 mm Glass/ 0.1 mm Glass	LTP	25000-50 page 35



FECAL & MICROBIOME

Kits designed for isolating genomic DNA from feces, stool, biosolids and gut material.

		Starting Sample	Time Minutes	Binding Capacity	Bead/ Tube Type	Throughput	Cat #
DNA	PowerFecal® DNA Isolation Kit	Up to 250 mg	30	Up to 20 µg per filter	0.7 mm Garnet/ 2 ml	LTP	12830-50 page 37
DNA	PowerMag® Microbiome DNA/RNA Isolation Kit	Up to 250 mg	V	> 50 µg per reaction	0.1 mm Glass/ 96 well bead plate	Automated HTP	27500-4-EP 27600-4-KF page 38
DNA	PowerViral™ Enviromental RNA/DNA Isolation Kit	Up to 250 µl	45	Up to 20 µg per filter	0.1 mm Glass/ 2 ml	LTP	28000-50 page 39 28000-BUNDLE (with Bead Plates)
RNA	PowerMicrobiome™ RNA Isolation Kit	Up to 250 mg	45	Up to 40 µg per filter	0.1 mm Glass/ 2 ml	LTP	26000-50 page 41

WATER

For the isolation of high quality genomic DNA or RNA from a variety of filtered water samples, including turbid waters and sterivex units.

		Starting Sample	Time Minutes	Binding Capacity	Bead/ Tube Type	Throughput	Cat #
DNA	PowerWater® DNA Isolation Kit	Turbid Water	20	Up to 20 µg per filter	0.15-0.7mm Garnet /5ml	LTP	14900-50-NF page 43 14900-100-NF
DNA	RapidWater® DNA Isolation Kit	Non-Turbid Water	14	Up to 20 µg per filter	0.15-0.7mm Garnet /5ml	LTP	14810-50-NF page 43
DNA	PowerWater® Sterivex DNA Isolation Kit	Water filtered with Sterivex	40	Up to 20 µg per filter	0.1mm Glass /5ml	LTP	14600-50-NF page 45
RNA	PowerWater® RNA Isolation Kit	Turbid Water	40	Up to 40 µg per filter	0.15-0.7mm Garnet /5ml	LTP	14700-50-NF page 43

TISSUE & CELLS

Kits designed for isolating genomic DNA from animal tissues, rodent tails and cultured cells without using organic solvents

		Starting Sample	Time Minutes	Binding Capacity	Lysis Method/ Tube Type	Throughput	Cat #
DNA	UltraClean® Tissue & Cells DNA Isolation Kit	25 mg	<20	Up to 20 µg per filter	0.7 mm Garnet/2 ml + ProK	LTP	12334-50 page 47 12334-250
DNA	UltraClean® -htp 96 Well Tissue DNA Isolation Kit	25 mg	45	Up to 20 µg per filter	0.7 mm Garnet/ 96 well bead plate + ProK	HTP	12996-4 12996-12
DNA	BiOstic® FFPE Tissue DNA Isolation Kit	1-5 slices up to 15 mg	140	Up to 20 µg per filter	Heat + ProK	LTP	12250-50 page 49
RNA	UltraClean® Tissue & Cells RNA Isolation Kit	10-30 mg	20	Up to 60 µg per filter	Heat + ProK	LTP	15000-50 page 47
RNA	PowerLyzer® UltraClean® Tissue & Cells RNA Isolation Kit	10-30 mg	20	Up to 60 µg per filter	2.8 mm Ceramic /2 ml	LTP	15055-50 page 47
RNA	BiOstic® FFPE Tissue RNA Isolation Kit	1-5 slices up to 15 mg	50	Up to 50 µg per filter	Heat + ProK	LTP	13250-50 page 49

SWAB

For rapid mechanical lysis of microbial cells from low biomass and low inhibitor containing swabs, paper or filter paper for direct application to PCR for metagenomic analysis.

		Starting Sample	Time Minutes	Binding Capacity	Bead/ Tube Type	Throughput	Cat #
DNA	UltraClean® -htp 96 Well Swab DNA Isolation Kit	Single swab, piece of paper or filter paper	10	Up to 20 µg per filter	0.1 mm Glass/ 2 ml	HTP	29000-4 page 51

V: Time varies based on the platform used to run protocol, starting sample type and vacuum equipment
LTP: Low throughput (1-24 samples)
HTP: High throughput (96 well)

BLOOD

Kits designed to isolate genomic and mitochondrial DNA and RNA from whole blood (fresh, frozen or stored at 4°C), buffy coat or cultured cells.

		Starting Sample	Time Minutes	Binding Capacity	Lysis Method	Throughput	Cat #
DNA	UltraClean® BloodSpin® DNA Isolation Kit	200 µl	20	Up to 20 µg per filter	Enzymatic Lysis	LTP	12200-50 page 53 12200-250
DNA	UltraClean® -htp 96 Well BloodSpin® DNA Isolation Kit	200 µl	V	Up to 20 µg per filter	Enzymatic Lysis	HTP	12296-4 page 54
DNA	UltraClean® Blood DNA Isolation Kit (Non-Spin)	300 µl	60	Up to 20 µg per filter	Enzymatic Lysis	LTP	12000-100 page 54
DNA	BiOstic® Bacteremia DNA Isolation Kit	1.8 ml cultured blood	45	Up to 20 µg per filter	0.15 mm Garnet	LTP	12240-50 page 54
RNA	BiOstic® Blood Total RNA Isolation Kit	2 ml of whole blood or 10 million cells	45	Up to 40 µg per filter	Enzymatic Lysis	LTP	12230-50 page 54

PLASMID PREP

	Starting Sample	Time Minutes	Binding Capacity	Lysis Method	Throughput	Cat #
UltraClean® Standard Mini Plasmid Prep Kit	1-5 ml cultures	10	Up to 40 µg per filter	Alkaline Lysis	LTP	12301-50 page 55 12301-100 12301-250

The UltraClean® Standard Mini Plasmid Prep Kit is based on the standard alkaline lysis technique used in most plasmid prep protocols.

UltraClean® 6 Minute Mini Plasmid Prep Kit	1-2 ml cultures	6	Up to 40 µg per filter	Alkaline Lysis	LTP	12300-50 page 56 12300-100 12300-250

The UltraClean® 6 Minute Mini Plasmid Prep Kit provides the fastest method and most efficient set of reagents available to purify plasmid DNA from 1 - 2 ml bacterial cultures. Based on a silica spin filter method, this kit elutes purified DNA in small working volumes of between 50 and 100 µl.

UltraClean® Midi Plasmid Prep Kit	50 ml cultures	45	Up to 1 mg per filter	Alkaline Lysis	LTP	12700-20 page 56
UltraClean® Maxi Plasmid Prep Kit	250 ml cultures	45	Up to 1 mg per filter	Alkaline Lysis	LTP	12600-10 12600-20 page 56

The UltraClean® Midi Plasmid Prep Kit and the UltraClean® Maxi Plasmid Prep Kit are designed to isolate plasmid DNA from large culture volumes of E. coli.

ENZYMES

	Unit Definition	Time	Catalog #
RTS DNase™ Kit	10 units/µl, removes 30µg of DNA	30 minutes	15200-50 page 57

For the removal of genomic DNA contamination in RNA preparations using a Room Temperature stable DNase I enzyme. Includes a novel resin to bind and remove DNase following the reaction RNase free.

On-Spin Column DNase I Kit (RNase-Free)	50 preps. Includes RNase-free water	15 minutes	15100-50

For removal of genomic DNA during the RNA extraction procedure.

Protein Extraction Kit

The NoviPure® Soil Protein Extraction Kit is designed to extract extracellular and intracellular microbial protein from a wide range of soil types without co-extraction of interfering compounds such as humic substances.

PROTEIN

	Starting Sample	Time	Bead/ Tube Type	Throughput	Cat #
NoviPure® Soil Protein Extraction Kit	2 - 5 g	3 hrs	0.1 mm Ceramic-0.1 mm Glass/50ml	LTP	30000-20 page 59

Certified Water

WATER

	Format	Catalog #
PCR Water (Certified DNA-Free) Water certified by PCR to be free of all DNA, RNase, and DNase contamination. Sterile and UV irradiated.	1ml	17000-1
	5 x 1 ml	17000-5
	10 x 1 ml	17000-10
	10 ml bottle	17000-11
Endotoxin-Free Water Water that is certified free of endotoxins.	100 ml	17013-100
	500 ml	17013-500
Molecular Biology Grade Water High quality water that is certified RNase and DNase free.	200 ml	17012-200
	5 x 200 ml	17012-5200
DEPC Treated Water DEPC Treated Water that is certified RNase and DNase free.	200 ml	17011-200
	5 x 200 ml	17011-5200

V: Time varies based on the platform used to run protocol, starting sample type and vacuum equipment
LTP: Low throughput (1-24 samples)
HTP: High throughput (96 well)

DNA/RNA CLEAN-UP

	Application	Format	Catalog #
PowerClean® Pro DNA Clean-Up Kit	For genomic DNA clean-up using IRT	Silica Spin Filter Tubes	12977-50 page 59
PowerClean® Pro RNA Clean-Up Kit	For genomic RNA clean-up using IRT	Silica Spin Filter Tubes	13977-50 page 59

These kits provides a quick, easy and reliable secondary clean-up method to purify previously isolated genomic DNA or RNA from any source for all downstream applications.

UltraClean® PCR Clean-Up Kit	After PCR or enzymatic reactions	LTP	Silica Spin Filter Tubes	12500-50 page 62
UltraClean®-htp 96 Well PCR Clean-Up Kit	After PCR or enzymatic reactions	HTP	Silica Spin Filter Plates	12596-4 page 62

The UltraClean® PCR Clean-Up Kit is designed to purify PCR products directly from a PCR or enzymatic reaction. If you sequence your PCR reactions or have applications where efficient removal of PCR primers is critical, this kit is your solution.

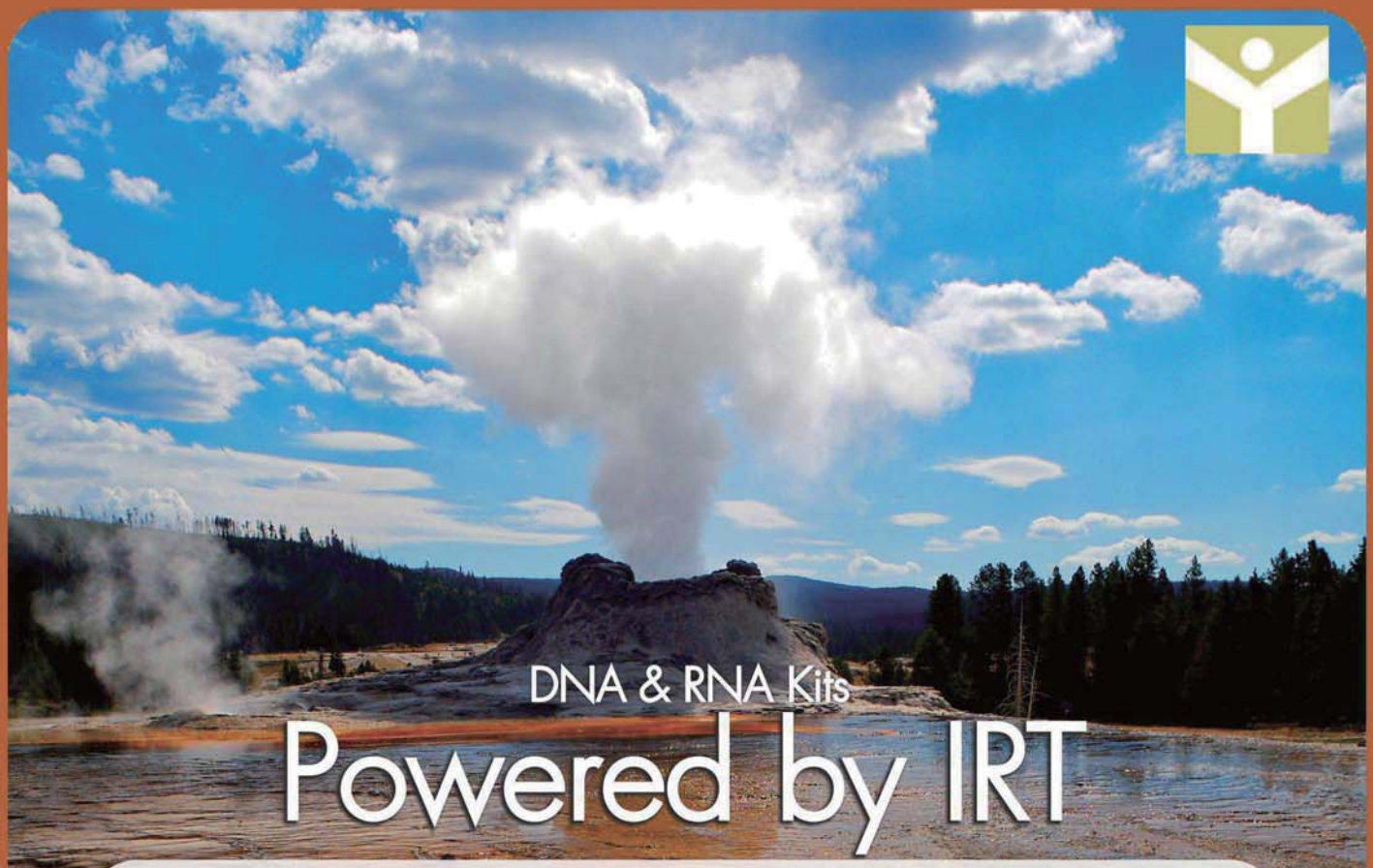
UltraClean® GelSpin® DNA Extraction Kit	Extraction from agarose gel	Silica Spin Filter Tubes	12400-50 page 62

The UltraClean® GelSpin® DNA Extraction Kit utilizes a silica-based spin filter membrane to isolate DNA from agarose gels. After electrophoresis, the desired DNA band is cut from the agarose gel and placed directly in the spin filter column.

UltraClean® 15 DNA Purification Kit	After PCR or enzymatic reactions Extraction from agarose gel/scalable	Silica Binding Particles	12100-300 page 62

The UltraClean® 15 DNA Purification Kit uses silica binding particles to extract DNA from agarose gels and enzymatic reactions.

V: Time varies based on the platform used to run protocol, starting sample type and vacuum equipment
LTP: Low throughput (1-24 samples)
HTP: High throughput (96 well)



DNA & RNA Kits

Powered by IRT

Power through the toughest PCR inhibitors and obtain high quality, high yield **DNA** and **RNA** from the world's most challenging samples with MO BIO's patented IRT (Inhibitor Removal Technology®)

Removes enzymatic PCR inhibitors including:

- humic acids
- fulvic acids
- polyphenols
- polysaccharides
- heme
- dyes

Preserve and Protect your Microbial DNA & RNA immediately upon collection with MO BIO's LifeGuard™ Soil Preservation Solution

IRT can be found in these MO BIO kits

- PowerFood™ Microbial DNA
- Bi0 stic® Bacteremia DNA
- PowerWater® DNA
- PowerSoil® DNA
- PowerPlant® DNA
- PowerClean® DNA Clean-Up
- RNA PowerSoil® Total RNA
- PowerMax® Soil DNA
- PowerSoil-htp® 96 Well Soil DNA
- PowerWater® RNA
- PowerBiofilm™ DNA
- PowerBiofilm™ RNA

MO BIO Laboratories, Inc.

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Quantitative Assessment of the Removal of Humic Acid from Purified DNA and Environmental Samples Using Inhibitor Removal Technology®

H. A. Callahan and S. J. Kennedy
MO BIO Laboratories, Inc., Carlsbad, CA

Introduction

Humic Substances (HSs) are large heterogeneous macromolecules that are the byproducts of organic decomposition of plants and microbes. Carryover of HSs during nucleic acid purification can reduce yields and inhibit applications such as PCR. Inhibitor Removal Technology® (IRT) is a patented method for removal of humic substances as well as polyphenolics and polysaccharides which are building blocks of HSs. IRT consists of two buffers. The first buffer solubilizes the DNA and precipitates proteins while the second buffer binds and precipitates the large macromolecules such as HSs, separating them from the nucleic acid. The importance of IRT for treatment of samples during nucleic acid extraction and purification was demonstrated by incorporating IRT into various DNA and RNA extraction kit protocols for environmental samples.

Methods

The following protocols containing IRT were used:

- PowerClean® DNA Clean-Up Kit (cat#12877): *For clean-up of humic acid spiked purified DNA*
- PowerWater® DNA Isolation Kit (cat#14900) and RapidWater® DNA Isolation Kit (cat#14810): *For purification of DNA from membrane filtered water (Elliot Bay, WA)*
- PowerBiofilm™ RNA Isolation Kit (cat#24000): *For purification of total RNA from biofilm (Buena Vista Lagoon, CA)*

PCR was performed using the KAPA2G FAST HotStart ReadyMix (cat.#51270) and qPCR was performed using the KAPA SYBR® FAST Kit (cat.#51230). Reverse transcription was performed using the QuantiTect® Reverse Transcription Kit (Qiagen).

Results

To analyze the effect of humic acid (HA) on amplification, HA was added to pure DNA in increasing amounts and then half of the sample was purified using the PowerClean® DNA Clean-Up Kit (**Fig. 1A**). Results indicated that PCR was inhibited by as little as 7.5 ng (0.75 ng/µl) of HA (**Fig. 1B**). Only the purified samples amplified and with equal efficiency, indicating that the PowerClean® DNA Clean-Up Kit was successful in removing volumes of HA up to 250 ng (25 ng/µl).

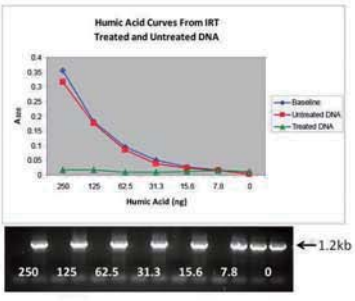

Figure 1. *E. coli* DNA (1.2 µg) was spiked with increasing concentrations of humic acid (up to 250 ng). Samples were divided in half and one set was cleaned up using a modified protocol from the PowerClean® DNA Clean-Up Kit for small volumes. A320 spec readings of untreated (red) and treated (green) samples (including HA curve in water (blue) as a baseline) is shown. End-point PCR with *Streptomyces* F/R 16S rRNA primers generated a 1,243 bp product.

When water from Elliot's Bay, WA was filtered and the DNA purified both with and without IRT (**Fig. 2**), the IRT purified samples demonstrated consistent Cq values at cycle 12. Non-IRT samples were severely shifted to late cycles and the duplicate samples varied greatly, indicating inhibition.

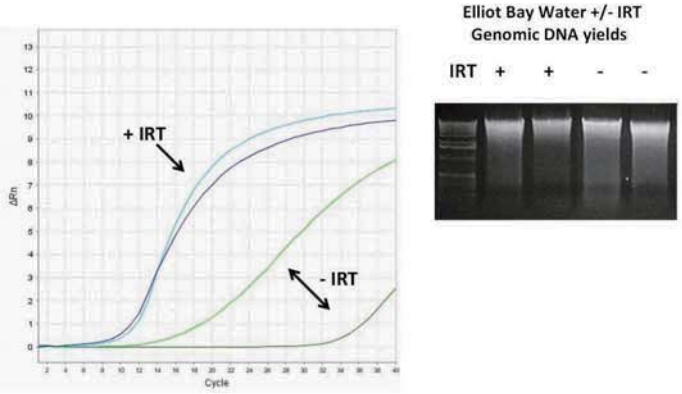

Figure 2. DNA was isolated from 50 ml of water from Elliot's Bay, WA, and filtered onto 0.45 µm mixed cellulose ester membranes in duplicate. Extraction was performed with the PowerWater® (with IRT) and RapidWater® (without IRT) kits. qPCR was performed using primers for total bacteria enumeration. Standard curve consisted of *E. faecalis* DNA with 104% efficiency using the same primers. Blue = + IRT, green = - IRT.

Biofilm RNA was purified (**Fig. 3A**) using either 100 µl or 200 µl of inhibitor removal solution (IRS). Amplification of a 1.2 kb sequence of the 16s rRNA gene was still inhibited using reduced IRS (**Fig. 3B**). A second RNA clean-up using IRT resulted in complete removal of inhibitors (**Fig. 3C**).

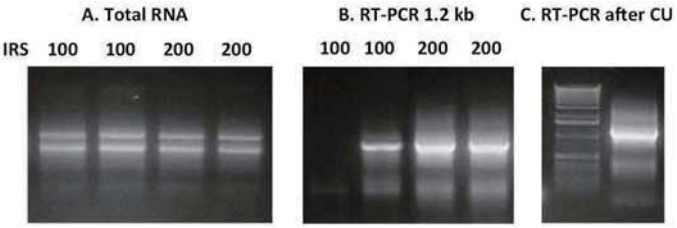

Figure 3. RNA was isolated from 0.15 g of biofilm from Buena Vista Lagoon, CA (**3A**). A 1.2 kb 16s rRNA gene fragment was amplified using RT-PCR (**3B**). The sample that did not amplify (**3B**) was re-purified using the PowerClean® Clean-Up Kit modified for RNA and RT-PCR was repeated (**3C**).

Conclusions

- Humic substances are an essential component of environmental samples
- Minute quantities of humic acid will inhibit PCR. IRT completely removes humic acid (even at high levels) and restores the ability of *Taq* to amplify the DNA.
- Environmental samples need IRT for sensitive quantitation.

DNA

PowerSoil® DNA Isolation Kit

Giving You the Power to Do More with Soil

- ✓ **Processes all soil types** including compost, sediment, clay and acidic soils
- ✓ **Inhibitor Removal Technology®** removes 100% of humic substances and PCR inhibitors
- ✓ **Rapid isolation** of genomic DNA
- ✓ **Variety of applications** including biodefense, soil-borne pathogen detection, agriculture and microbiome research

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PowerSoil® DNA Isolation Kit

MO BIO Laboratories

Giving You the Power to Do More with Soil

Powered by IRT

The PowerSoil® DNA Isolation Kit is our most effective soil DNA kit, which uses our novel, MO BIO patented Inhibitor Removal Technology® (IRT) to extract microbial DNA from all soil types and other environmental samples. The isolated DNA has the highest level of purity allowing for more successful PCR and qPCR amplification of organisms from the sample. The kit is ideal for processing all environmental samples including difficult types containing a high humic acid content such as compost, sediment, and manure. PCR analysis has been performed to detect a variety of organisms including both Gram-positive and Gram-negative bacteria (e.g. *Bacillus subtilis*, *Bacillus anthracis*), fungi (e.g. yeasts, molds), algae, and actinomycetes (e.g. *Streptomyces*), and nematodes. The PowerSoil® DNA Isolation Kit is also available in a 96 well format.

Next Generation Technology

The PowerSoil® DNA Isolation Kit distinguishes itself from other kits with IRT, a patented humic substance/brown color removal technology that removes PCR inhibitors from even the most difficult soil types, promoting successful downstream PCR analysis.

Kit Versatility

Our customers use this kit successfully on diverse sample types such as Rhizosphere samples and hydrocarbon contaminated samples, skin, vaginal and surface swabs, and in a variety of applications including biodefense, agriculture and microbiome analysis. These soil kits are used by the USEPA, USDA, FBI and CDC for soil analysis.
For fecal samples, The PowerFecal™ DNA Isolation Kit is now available (Cat# 12830-50), with identical chemistry and dry bead tubes.

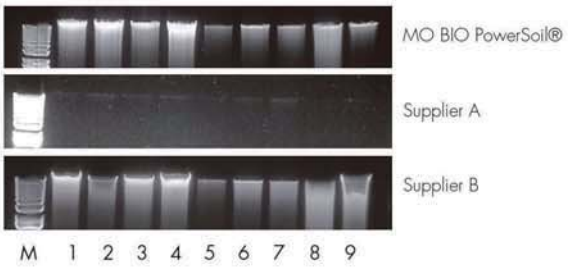
Specifications

Format	Silica Spin Filter Tubes
Method	Bead Beating
Binding Capacity	Up to 20 µg per filter
Throughput	1 - 24 samples
Time	30 minutes
Starting Amount	250 mg
Equipment Required	Vortex and Vortex Adapter

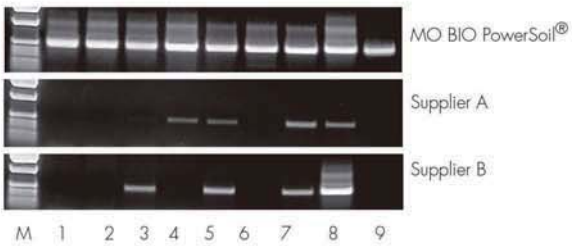
The difference is clear!

100% of DNA samples isolated with the MO BIO PowerSoil® DNA Isolation Kit showed no carry-over of brown humic substances and no PCR inhibition.

The PowerSoil® DNA Isolation Kit is More Effective for Community Analysis by PCR



High Yield, Intact Genomic DNA. Total Genomic DNA was isolated from nine different sample types using the MO BIO PowerSoil® DNA Isolation Kit and soil DNA isolation kits from two other suppliers. All isolations were performed following the manufacturers' protocols. Eluted genomic DNA was displayed on a 0.8% TAE agarose gel (15 µl per lane).



Confidence in Your PCR Analysis. PCR analysis using eubacterial primers was performed on 1 µl of the undiluted DNA eluate. PCR products were displayed on a 0.8% TAE agarose gel. Lane M is DNA Marker.

Lane 1 - **Landfill 0-3 inches**
Lane 2 - **Landfill 3-6 inches**
Lane 3 - **Late-stage Compost**
Lane 4 - **Coffee Compost**
Lane 5 - **Marine Sediment**
Lane 6 - **Lake Sediment**
Lane 7 - **Mud Sediment**
Lane 8 - **Horse Manure**
Lane 9 - **Mulch Topsoil**

Only DNA isolated with PowerSoil® yielded a PCR product for Landfill samples (lanes 1 and 2), Lake Sediment (lane 6) and Mulch Topsoil (lane 9). DNA isolated using other supplier kits failed to amplify products for these samples, most likely due to high levels of humic acid substances remaining in the final DNA eluate.

Positive PCR amplification using PowerSoil® was observed with 100% of the samples. PCR analysis resulted in only 44% positive amplification with supplier kits tested.

Order information

Catalog No.	Description	Quantity
12888-50	PowerSoil® DNA Isolation Kit	50 preps
12888-100	PowerSoil® DNA Isolation Kit	100 preps
12955-4	PowerSoil®-htp 96 Well DNA Isolation Kit	4x96 preps
12955-12	PowerSoil®-htp 96 Well DNA Isolation Kit	12x96 preps

Application Note

Determining the Best Homogenization Protocol for Any Soil

Nik von Atzigen and Suzanne Kennedy, Ph.D.
MO BIO Laboratories, Inc., 2746 Loker Avenue West, Carlsbad, CA 92010

Introduction

Isolating DNA from soil begins with various methods to homogenize the sample. The choice of homogenization method is influenced by several factors including the texture or composition of the soil, the microbial community of interest, and the size requirement of the isolated genomic DNA. Both vortex and high powered bead beating methods efficiently lyse microbial cells, but for some applications, the use of a bead beating homogenizer may be preferred in order to achieve stronger lysis of tough organisms such as fungi and spores. When using a high-velocity bead beating instrument, glass beads are traditionally recommended because of their ability to withstand the acceleration forces without crushing the grinding matrix. Conversely, we have found that the optimal type of grinding matrix is heavily dependent on the soil type. To determine the best bead type and speed for homogenization, we evaluated two soil types for DNA purity and yield using the PowerLyzer™ 24 Bench Top Bead-Based Homogenizer with either a 0.1 mm glass bead tube or a 0.7 mm garnet bead tube. Our results demonstrate that extraction of high yield and integrity DNA in soils can vary significantly under the same bead beating conditions and that optimization for the method that achieves the best results should be considered prior to adopting a standardized homogenization protocol.

Methods

Soil samples from the California Polytechnic State University, Earth and Soil Science Department were obtained and characterized. Soil 1 consisted of 45% clay, 2.5% carbon, pH 8. Soil 2 consisted of silty soil containing 40% clay, 4.9% carbon, pH 8. DNA was isolated from 0.25 g of sieved soil according to protocol using either the PowerLyzer™ PowerSoil® DNA Isolation Kit (cat. no. 12855-50, containing glass bead tubes) or the PowerSoil® DNA Isolation Kit (cat. no. 12888-50, containing garnet bead tubes) with the PowerLyzer™ 24 Homogenizer for 45 seconds at the indicated speeds described in each figure. DNA was eluted in 50 µl, electrophoresed in a 1% agarose gel, and analyzed using a NanoDrop® 1000 spectrophotometer.

Results

To evaluate the difference in DNA yields obtained by using the garnet beads vs. the 0.1 mm glass beads with a high-velocity bead beating instrument, we compared two soils with similar characteristics. The first soil contained a high percentage of clay and a low carbon content, which typically correlates with lower microbial biomass and lower DNA yields. The second soil contained a lower percent clay and a higher carbon content, and had a higher biomass based on DNA yields.

When Soil 1 was extracted using increasing speed from 2,000 RPM up to the maximum speed of 5,000 RPM for 45 seconds, distinct differences in yield were observed between the garnet and glass bead tubes **(Figure 1)**. In general, the glass bead tubes extracted higher yields of DNA compared to garnet bead tubes, which achieved maximum DNA yields between 3,900-4,200 RPM. Beyond 4,200 RPM, DNA yields fell significantly. With garnet bead tubes, maximum DNA yield was obtained using 3,900 RPM. However, yields were only half that of the glass bead tubes at this speed.

Isolation of DNA from soil containing a high clay content using the PowerLyzer™ 24 Homogenizer

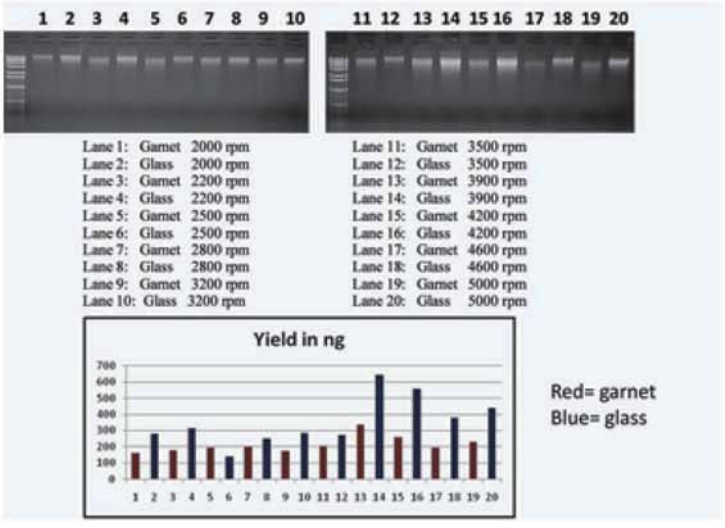


Figure 1. DNA isolation from clay soil (soil 1) with increasing speed for 45 seconds. DNA yields remain consistent with either glass or garnet bead tubes until speeds reach 3,900-4,200 RPM where maximum DNA recovery is achieved using glass bead tubes. DNA yields decline when the bead beating speed exceeds 4,200 RPM, indicating that too much force can be detrimental to DNA recovery.

To compare these results with another soil, a silty soil (soil 2) containing 40% clay and double the carbon content was evaluated. DNA yields and integrity were analyzed **(Figure 2)** using identical protocols as previously described. DNA yields were similar between glass and garnet bead tubes between 2,500-3,200 RPM and appeared as expected with high molecular weight products on an agarose gel. Garnet bead tubes performed best at 3,200 RPM but beyond that speed, DNA integrity was negatively affected. Maximum yields, as measured by the NanoDrop® 1000 spectrophotometer, were achieved with garnet bead tubes at 4,200 RPM. However, the resulting sheared DNA may have resulted in a higher absorbance at A_{260} and therefore, falsely indicating an increase in DNA yield. Glass bead tubes performed best at low speed (2,000 RPM). Beyond 3,200 RPM, the DNA yield dropped significantly. Although DNA recovery using glass beads at the higher speeds reached the same yield (according to the NanoDrop® 1000 spectrophotometer) as that obtained at 2,000 RPM, the yield and quality at higher speeds are not as consistent at the lower speeds (according to agarose gel electrophoresis). This data demonstrates that a different bead type may be acceptable for some soils but homogenization speed must also be optimized and adjusted accordingly to each sample type.

Isolation of DNA from a silty clay soil using the PowerLyzer™ 24 Homogenizer

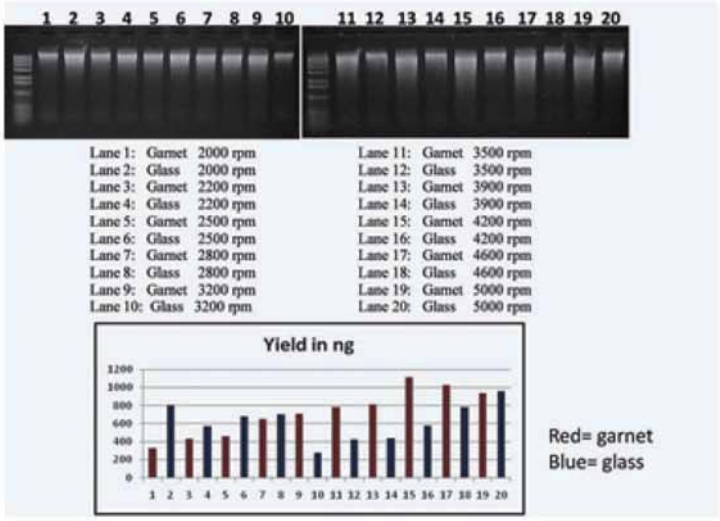


Figure 2. DNA from silty clay soil was extracted using the PowerLyzer™ 24 Homogenizer with increasing speed for 45 seconds. DNA yields demonstrate that soil 2 performed better with less vigorous bead beating and that the garnet bead tubes performed equally as well as the glass bead tubes. Optimal DNA yields were achieved at lower speeds using the glass bead tubes while the garnet bead tubes required higher speeds for maximum DNA yields.

Summary

The first step required for extracting DNA from soil involves mechanical lysis and homogenization. Here, we have demonstrated that the homogenization method, the type of bead tube, and the type of soil sample each influence the outcome of DNA extraction, and that optimization is critical for complete and successful extraction results.

In this study, two soils similar in clay content but different in carbon content were evaluated for the effects of increased bead beating forces under constant time. Results indicated distinct differences between soils and bead tube types. The soil containing the higher clay content was extracted more effectively using the 0.1 mm glass bead tubes while the silty clay soil was extracted equally as well using either glass or garnet bead tubes. The higher clay soil tolerated a much harder force of homogenization and resulted in high quality, intact DNA while the silty clay soil resulted in a high level of sheared DNA with increased RPM speed. Overall, our results demonstrate that extraction of DNA from clay soils is improved using glass beads as the grinding matrix.

In summary, these results demonstrate that every soil needs to be examined individually in order to determine the best speed of homogenization that generates the highest yields of DNA with the least sample damage. Since bead type also influences integrity, we recommend comparing garnet bead tubes to glass bead tubes to assess which bead type provides the highest yields of DNA from your soil.

More information on the differences between bead types and homogenization methods can be found in a poster presented at ASM 2010 in collaboration with the laboratory of Chris Kitts entitled, ***Comparison of Microbial Populations Isolated from a Variety of Soils using Different Homogenization Methods During DNA Extraction*** *at http://www.mobio.com/images /custom/file/MicroPopPoster2010.pdf.*

Catalog No.	Description	Quantity
13155	PowerLyzer™ 24 Bench Top Bead-Based Homogenizer, (110/220V)	1 unit
13156	PowerLyzer™ Tube Holder	1 unit
13157	PowerLyzer™ Tube Holder Stand	1 unit
12855-50	PowerLyzer™ PowerSoil® DNA Isolation Kit	50 preps
12855-50-BS	PowerLyzer™ PowerSoil® Bead Solution	42 ml
12255-50-GBT	PowerLyzer™ Glass Micro Bead Tubes, 0.1 mm	50 Tubes
13118-50	Glass Bead Tubes, 0.1 mm	50 Tubes
13118-400	Glass Beads, 0.1 mm, Bulk (500 preps, 400g)	400 g
13123-05	Garnet Beads, 0.70 mm, Bulk (500g)	500 g
13123-50	Garnet Bead Tubes, 0.70 mm	50 Tubes

MO BIO Laboratories, Inc.

PowerMax®
Soil DNA Isolation Kit

The power to do more

More Soil - Process up to 10 g of soil in less than 90 minutes.

More Sample Types - Maximize DNA recovery from large-scale soil or environmental samples, low biomass samples, sediments, compost and manure.

More PCR Results - Inhibitor Removal Technology® removes 100% of humic substances and other PCR inhibitors resulting in DNA that is ready to use in PCR, qPCR and next generation sequencing.

MO BIO Laboratories, Inc.
Saving You Time For Life

Ordering Information

Catalog No.	Description	Quantity
12988-10	PowerMax® Soil DNA Isolation Kit	10 Preps
Related Products		
12888-50	PowerSoil® DNA Isolation Kit	50 Preps
12855-50	PowerLyzer™ PowerSoil® DNA Isolation Kit	50 Preps

www.mobio.com

PowerMax® Soil DNA Isolation Kit

The power to do more

The PowerMax® Soil DNA Isolation Kit provides researchers with a patented method for isolating DNA from up to 10 grams of soil. PCR inhibiting substances, including humic acids are completely removed. The kit is intended for use with all common soil types, particularly with samples that typically contain a high humic substance content, including compost, sediment and manure.

Samples are added to a bead beating tube with a kit-supplied buffer for rapid and thorough homogenization. Total genomic DNA is captured on a silica spin filter membrane, washed and eluted, DNA is ready to use in downstream applications including qPCR and next generation sequencing.

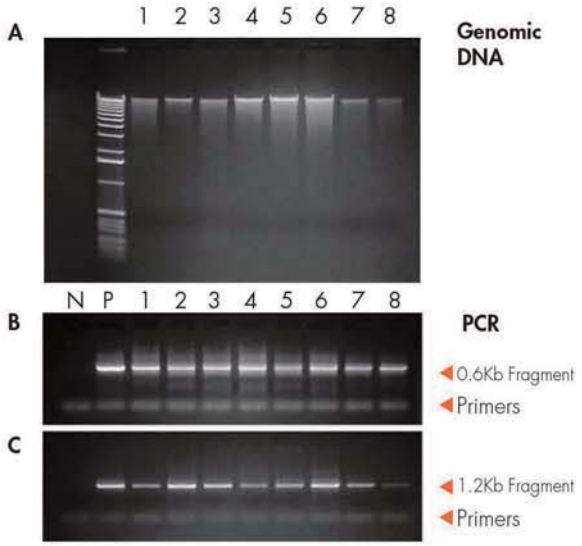
Specifications

Format	Silica Spin Filter Tubes
Method	Bead Beating
Binding Capacity	1mg
Time	90 minutes
Equipment Required	Microcentrifuge, benchtop centrifuge, vortex, vortex adaptor

Ordering Information

Catalog No.	Description	Quantity
12988	PowerMax® Soil DNA Isolation Kit	10 Preps
Related Products		
12888-50	PowerSoil® DNA Isolation Kit	50 Preps
12888-100	PowerSoil® DNA Isolation Kit	100 Preps
12855-50	PowerLyzer™ PowerSoil® DNA Isolation Kit	50 Preps
12855-100	PowerLyzer™ PowerSoil® DNA Isolation Kit	100 Preps

High Yield and Reliavble PCR Results



Total genomic DNA was isolated from 8 different soil samples using the PowerMax® Soil DNA Isolation Kit (Lanes 1-8). Genomic DNA was displayed (A) on a 1% TAE agarose gel (15 µl per lane). PCR analysis with primers representing the *Streptomyces* genus (B) and *Bacillus* genus (C) was performed using 1 µl of the undiluted DNA and analyzed on a 1% TAE agarose gel and stained with ethidium bromide. N = Negative control. P=Positive control. Similar results were obtained with primers to eubacterial DNA. Soil Types and amount are identified below.

Soil Types and Amounts

Sample Lane	Type	Amount Processed (grams)
1	Iowa corn field	10
2	So. California strawberry field	10
3	Cardiff estuary sediment	10
4	Carlsbad lagoon sediment	10
5	Home compost	5
6	San Diego City compost	5
7	Commercial potting mixture	2.5
8	Commercial peat moss	2.5

深圳市安必胜科技有限公司

DNA

PowerMag® Soil DNA Isolation Kit

Magnetize your Research with ClearMag® Technology

✓**Optimized for tough samples -** Automated Isolation of high quality DNA from soil, environmental samples and stool samples

✓**ClearMag® Technology -** Novel magnetic particle technology captures DNA without binding organic inhibitors, facilitating isolation of pure DNA

✓**Hands-free purification -** Optimized for use with KingFisher® and epMotion® automated processing systems

✓**Inhibitor Removal Technology®-** Removes PCR-inhibiting compounds including humic substances, phenolics and polysaccharides

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PowerMag® Soil DNA Isolation Kit

Magnetize your Research

Description

The PowerMag® Soil DNA Isolation Kit is designed for automated isolation of microbial DNA from all soil types and other environmental samples, as well as stool, compost, sediment and manure. The protocol is designed for isolation of DNA from up to 0.25 g of sample and includes patented Inhibitor Removal Technology® to remove humic substances and other PCR inhibitors. Novel ClearMag® technology enables purification of DNA without the typical surface binding to the beads, eliminating the adsorption of organic inhibitors that is typical of other magnetic bead technologies, and facilitating isolation of pure DNA. In addition, neither chaotropic salts nor ethanol are used in the binding and washing steps, removing a second source of contamination that can inhibit enzymatic reactions. The PowerMag® Soil DNA Isolation Kit has been optimized for use with the Thermo Scientific KingFisher® Flex and Duo and the Eppendorf epMotion® 5075 TMX platforms, for rapid, high-throughput isolation of inhibitor-free DNA. The high-quality DNA isolated with the PowerMag® Soil DNA Isolation Kit is ready to use in PCR, qPCR and next generation sequencing.

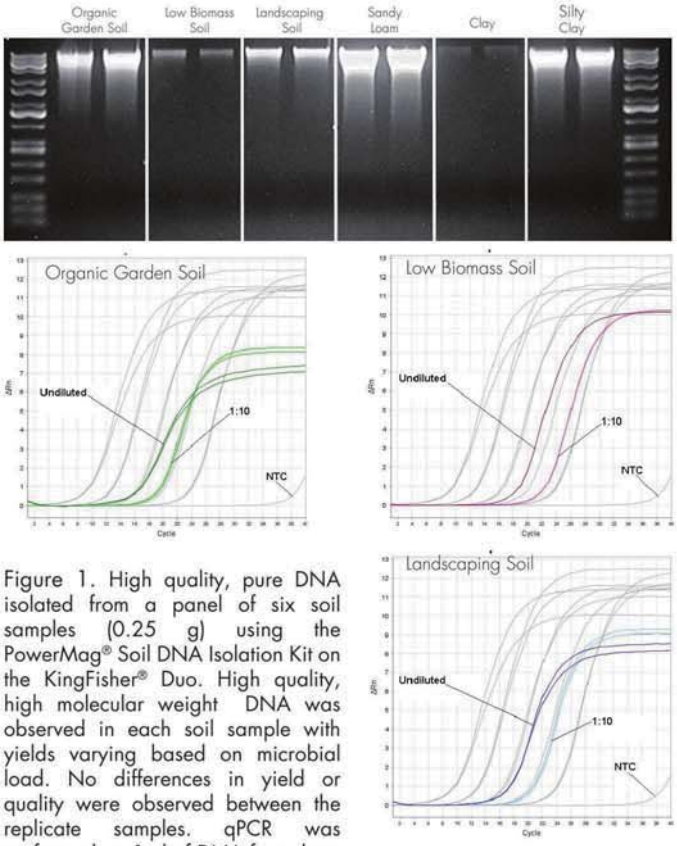

Figure 1. High quality, pure DNA isolated from a panel of six soil samples (0.25 g) using the PowerMag® Soil DNA Isolation Kit on the KingFisher® Duo. High quality, high molecular weight DNA was observed in each soil sample with yields varying based on microbial load. No differences in yield or quality were observed between the replicate samples. qPCR was performed on 1 µl of DNA from three soil types known to be high in PCR inhibitors, using primers for *Bacillus*. Undiluted DNA and samples diluted 1:10 fell within the standard curve (grey lines), and the difference between the diluted and undiluted samples was approximately 3 cycles, indicating the DNA was free of inhibitors.

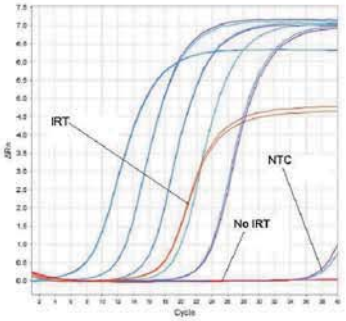

Figure 2. Inhibitor Removal Technology® (IRT) is essential for removal of PCR inhibitors. DNA was isolated from organic garden soil samples using the PowerMag® Soil DNA Isolation Kit with and without the IRT step and purified using the KingFisher® Duo. qPCR was performed as described in Figure1. Samples processed without IRT failed to amplify, while samples with IRT were successfully amplified and fell within the standard curve (blue lines).

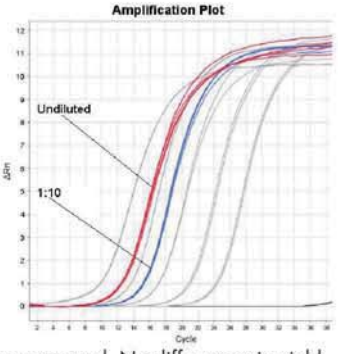

Figure 3. High quality, pure DNA isolated from 0.25 g of organic garden soil using the PowerMag® Soil DNA Isolation Kit on the epMotion® 5075 TMX. High quality, high molecular weight DNA was observed in eight replicate samples examined on a 1% agarose gel. No differences in yield or quality were observed between the replicate samples. qPCR was performed using primers for *Bacillus* on 1 µl of DNA. Undiluted DNA and samples diluted 1:10 fell within the standard curve (grey lines), and the difference between the diluted and undiluted samples was approximately 3 cycles, indicating the DNA was free of inhibitors.

Specifications

Format	ClearMag® Technology
Method	Bead Beating
Starting Amount	0.25 g
Throughput	96 well plate
Equipment Required	• Plate Shaker for homogenization of samples in 96 well blocks (recommended: MO BIO Catalog# 11996) • Centrifuge capable of handling two 96 well blocks • KingFisher® Flex or Duo Magnetic Particle Processor, or epMotion® 5075 TMX Automated Pipetting System • Magnetic Separator (PowerMag® Magnetic Separator, Catalog # 27400 recommended for use with epMotion® system)

Order information

Catalog No.	Description	Quantity
27000-4-KF	PowerMag® Soil DNA Isolation Kit (Optimized for KingFisher®)	4 x 96 Preps
27100-4-EP	PowerMag® Soil DNA Isolation Kit (Optimized for epMotion®)	4 x 96 Preps

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Tel: 0755-8348 9872
Fax: 0755-8348 9700
email: anbiosci@126.com
QQ:1362545403

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Saving You Time For Life

RNA PowerSoil®

Total RNA Isolation Kit

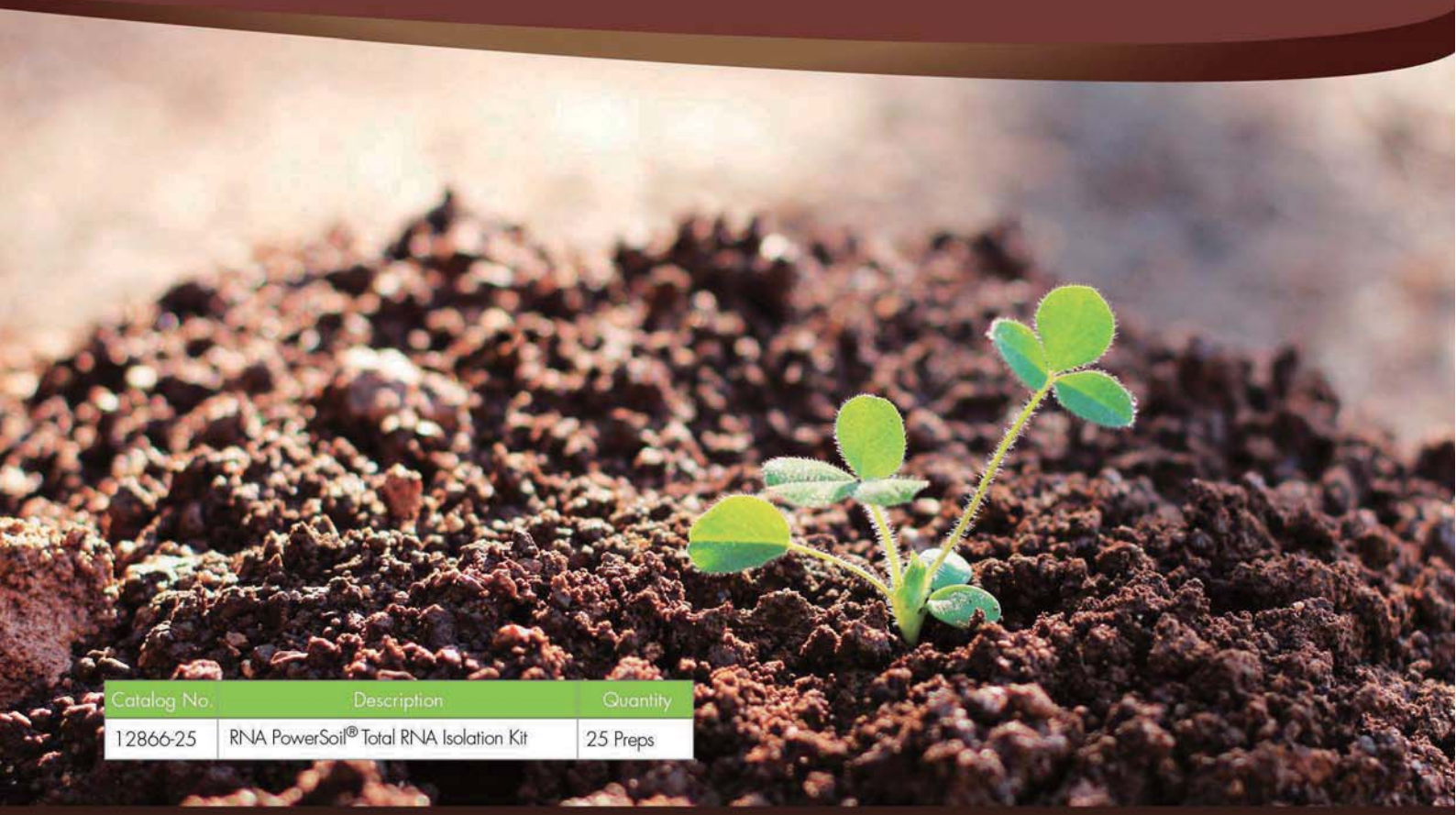
Giving you the power to do more

Processes all soil types - Including difficult environmental samples

High Quality RNA - RNA is ready for use in all downstream applications including qPCR and next generation sequencing

Optimized Protocol - Purifies RNA from up to 2 grams of soil in less than 2.5 hours

High Purity - Isolate RNA free of humic substances and other PCR inhibitors



Catalog No.	Description	Quantity
12866-25	RNA PowerSoil® Total RNA Isolation Kit	25 Preps

中国总代理：深圳市安必胜科技有限公司

网址：www.anbiosci.com 邮箱：anbiosci@126.com 电话：0755-83489872 QQ：1362545403

RNA PowerSoil® Total RNA Isolation Kit

Giving you the power to do more

The RNA PowerSoil® Total RNA Isolation kit provides an optimized method for isolating total RNA from up to 2 grams of soil. RT-PCR and PCR inhibiting substances, including humic acids are completely removed. The kit is intended for use with all common soil types, but in particular, with samples that typically contain a high humic substance content, including compost, sediment and manure.
RT-PCR was used to analyze undiluted total RNA purified using the RNA PowerSoil® Total RNA Isolation Kit. Primers were specific for *Bacillus* and *Streptomyces spp* (see A,B,C).

The kit offers a simple and easy-to-follow procedure. Environmental samples are added to a bead beating tube with a kit-supplied buffer for rapid and thorough homogenization. Total RNA is captured on an anion exchange column, washed and eluted. RNA is ready for use in downstream applications without further handling or purification.

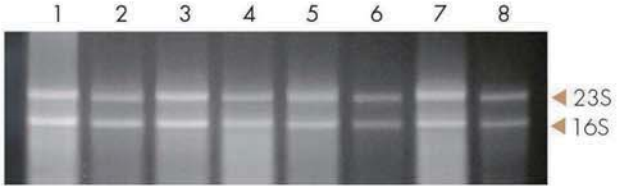


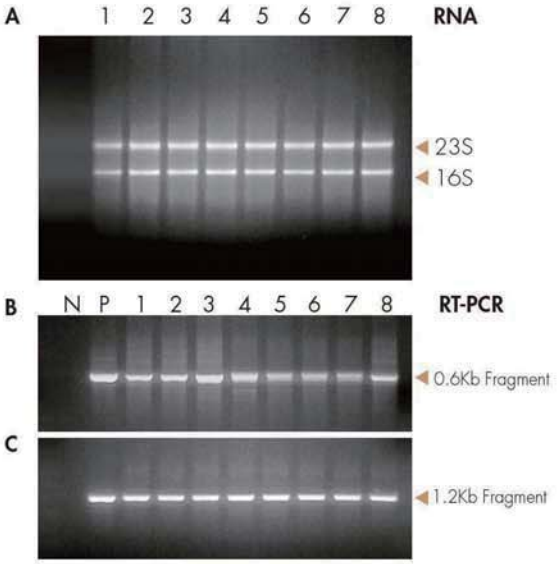
Table 1. Soil Types and Amounts

Sample Lane	Type	Amount Processed (grams)
1	Residential Lawn	2
2	Strawberry Field	2
3	Plant root rhizosphere	2
4	Lagoon sediment	2
5	Amended soil	2
6	Corn field	2
7	Compost	1
8	Sandy soil	2

Catalog No.	Description	Quantity
12866-25	RNA PowerSoil® Total RNA Isolation Kit	25 Preps
Related Products		
12867-25	RNA PowerSoil® DNA Elution Accessory Kit	25 Preps
12888-50	PowerSoil™ DNA Isolation Kit	50 Preps
12888-100	PowerSoil™ DNA Isolation Kit	100 Preps
12888-10	PowerMax™ Soil DNA Isolation Kit	10 Preps
12855-50	PowerLyzer™ PowerSoil® DNA Isolation Kit	50 Preps
12855-100	PowerLyzer™ PowerSoil® DNA Isolation Kit	100 Preps

RNA PowerSoil® Total RNA Isolation Kit

High Yield and Reliable RT-PCR Results



Total RNA was isolated from 8 different soil samples using the RNA PowerSoil® Total RNA Isolation Kit (Lanes 1-8). RNA was displayed (A) on a 1% TAE agarose gel (2µg per lane). RT-PCR analysis with primers representing the *Streptomyces spp* (B) and *Bacillus spp.* (C) was performed using 1 µl of the undiluted RNA and analyzed on a 1% TAE agarose gel stained with ethidium bromide. N=Negative control. P=Positive control. Soil types and amount are identified in table1.

Specifications

Format	Anion Exchange Column Purification
Method	Bead Beating
Sample Size	Up to 2 grams of soil
Time	Less than 2.5 Hours
Equipment required	Microcentrifuge, benchtop centrifuge, vortex, vortex adaptor

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电话：0755-83489872 QQ：1362545403

LifeGuard™ Soil Preservation Solution

Stabilization of Microbial RNA in Soil

Optimized for Soil

RNA stabilization is no longer limited to products for human tissue

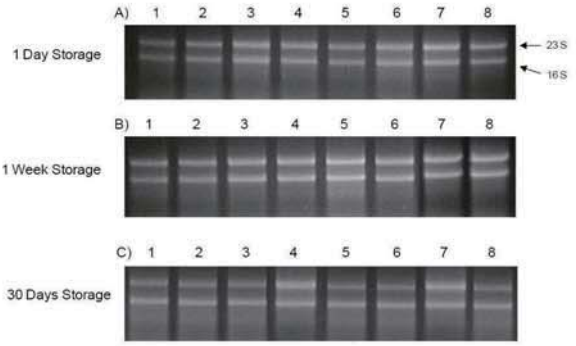
Transport at ambient temperature

No need to transport dry ice or liquid nitrogen to collection sites

Immediate RNA Stabilization

Locks microbial RNA in stasis and inactivates RNases to preserve nucleic acid integrity

Protects microbial RNA until analysis



Soil samples stored in LifeGuard™ Solution are stable for 30 days of storage at various temperatures.

MO BIO Laboratories, Inc.

Saving You Time For Life

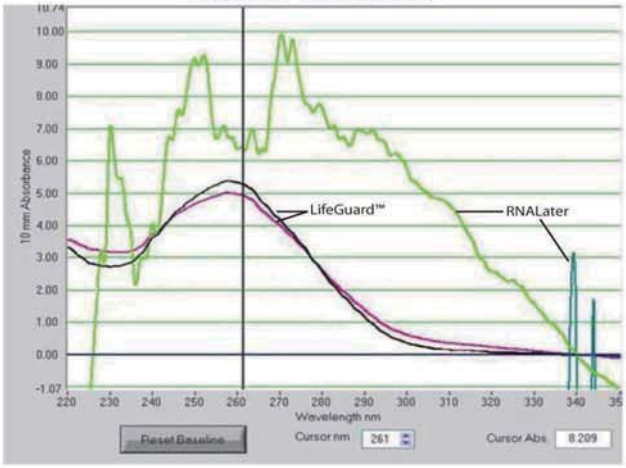
www.mobio.com/lifeguard

800-606-6246

Catalog # 12868-100, 12868-1000

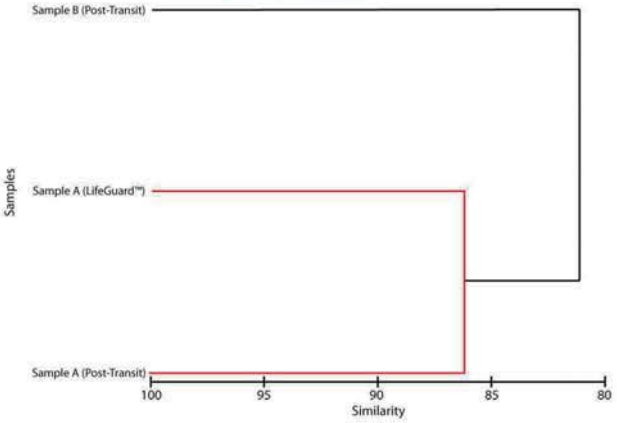
Lifeguard™ Soil Preservation Solution

Purity of RNA from Soil Stored in LifeGuard™ vs. RNALater



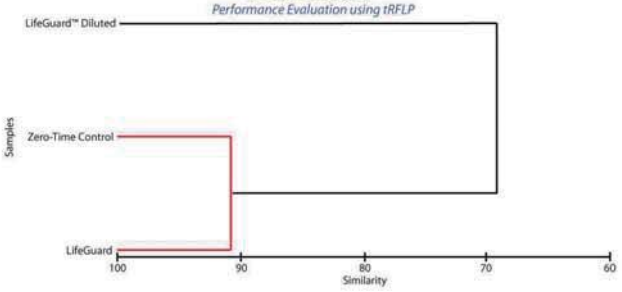
Temperate soils (2 grams) were stored in 5 ml of either LifeGuard™ or RNALater and stored for 2 weeks at 4°C. RNA was extracted using the RNA PowerSoil Isolation Kit. Yield and purity readings were measured using a Nanodrop. The RNALater stored soil samples resulted in RNA that was unquantifiable (green and blue curves). Using the LifeGuard™ Soil Preservation Solution (purple and black curves), the yields and purity were high quality and consistent between preps (average ratios for 260/280 were 2.0 and 260/230 were 1.9).

MO BIO LifeGuard™
Field versus Post-Transit



Antarctic Dry Valley soil samples were collected and immediately stabilized in LifeGuard™ Soil Preservation Solution and shipped at 4°C to New Zealand. Unstablized samples were shipped until identical conditions and stored for 30 days at 4°C under simulated daylight. Temperature record placed within the samples indicated that significant temperature spikes were present during transit. RNA was extracted from both stabilized and unstabilized samples using the RNA PowerSoil® Total RNA Isolation Kit. Total full-length cDNA was generated from the RNA samples and analyzed using tRFLP to characterize bacterial communities present. Yields of RNA collected for the unstabilized soil (Sample A and Sample B, Post-Transit) were 7.4 µg and 4.8 µg, respectively, and 7.36 µg for stabilized soil (Sample A LifeGuard ™). tRFLP profiles of stabilized and unstablized Sample A are 86% similar, and additional phylotypes were detected in the unstabilized sample compared to the LifeGuard™ stabilized soil, indicative that community composition altered during transit and the time in storage. It is almost certain that the collective gene expression pattern of the community (i.e., metatranscriptome) has changed for the unstabilized sample and is significantly different to that observed in the field. (Data kindly provided by Dr. Charles Lee, University of Wakaito, NZ).

MO BIO LifeGuard™
Performance Evaluation using tRFLP



Antarctic Dry Valley soil was processed directly using the RNA PowerSoil® Total RNA Isolation Kit after storage at 4°C, or preserved with LifeGuard™ Soil Preservation Solution, incubated for 72 hours at RT, then processed with the same kit. cDNA was generated from the RNA samples using a primer specific for bacterial 16S rRNA gene and analyzed using tRFLP to characterize bacterial communities present.tRFLP profiles of stabilized and unstablized Sample A are over 90% similar, and the same sample preserved with a diluted LifeGuard solution has a significantly different tRFLP profile. The results indicating that soil preserved with LifeGuard™ yielded full length RNA with no observable loss in bacterial diversity compared to fresh samples. (Data kindly provided by Dr. Charles Lee, University of Wakaito, NZ).

The LifeGuard™ Soil Preservation Solution is the first reagent of its kind that can prevent microbial growth while maintaining nucleic acid integrity in samples stored at various temperatures and over a time range of up to 30 days. Because it is bacteriostatic, microbes remain intact allowing for recovery of RNA and DNA from living cells. LifeGuard™ Solution overcomes the problems associated with accurate community profiling in soils collected at remote locations throughout the world that need to be transported to the lab under fluctuating or inconsistent temperature conditions. Protect your precious samples with the only solution available specifically designed for the isolation of high quality nucleic acids from any kind of soil.

Catalog No.	Description	Quantity
12868	LifeGuard™ Soil Preservation Solution	100ml, 1 l
12866-25	RNA PowerSoil® Total RNA Isolation Kit	25 preps
12867-25	RNA PowerSoil® DNA Elution Accessory Kit	25 preps
12888	PowerSoil® DNA Isolation Kit	50 preps, 100 preps

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MO BIO Laboratories, Inc.

Microbial DNA and RNA Isolation

Designed for Tough Samples – Isolate nucleic acids from yeast, fungi, spores, Gram-negative and Gram-positive bacteria

Optimized Bead Beating Technology – Mechanical action effectively lyses microorganisms, increasing DNA and RNA yields

High Quality DNA & RNA – Inhibitor-free nucleic acids are ready to use in PCR, qPCR and sequencing

Complete Kits – All tubes and reagents required are included and ready to use

ULTRACLEAN® MICROBIAL DNA ISOLATION KIT

Isolate DNA from microbial cultures in 20 minutes.
Yields high quality DNA that is ready for PCR.

ULTRACLEAN®-HTP 96 WELL MICROBIAL DNA ISOLATION KIT

High-throughput DNA isolation from up to 96 microbial samples in 1.5 hours

POWERLYZER™ ULTRACLEAN® MICROBIAL DNA ISOLATION KIT

Optimized for use with bead based homogenizers such as the PowerLyzer™ 24 for rapid isolation of DNA from microbial cultures

ULTRACLEAN® MICROBIAL RNA ISOLATION KIT

Isolate total RNA from microbial cultures in 35 minutes.
Yields up to 60 µg high quality RNA for use in RT-PCR

NEW

POWERMAG® MICROBIAL DNA ISOLATION KIT

Magnetic Bead Technology (SwiftMag™) for rapid, high-throughput isolation of inhibitor-free DNA. Optimized for use with the Thermo Scientific KingFisher® Flex and KingFisher® Duo and the Eppendorf epMotion®.

Catalog No.	Description	Quantity
12224-50	UltraClean™ Microbial DNA Isolation Kit	50 Preps
12224-100	UltraClean™ Microbial DNA Isolation Kit	100 Preps
12255-50	PowerLyzer™ UltraClean® Microbial DNA Isolation Kit	50 Preps
15800-50	UltraClean™ Microbial RNA Isolation Kit	50 Preps
15800-250	UltraClean™ Microbial RNA Isolation Kit	250 Preps
10196-4	UltraClean-htp™ 96 Well Microbial DNA Kit	4x96 Preps
10196-12	UltraClean-htp™ 96 Well Microbial DNA Kit	12x96 Preps
27200-4	PowerMag™ Microbial DNA Isolation Kit	4x96 Preps

Microbial DNA and RNA Isolation

The UltraClean™ Microbial DNA and RNA Isolation Kits are designed to isolate high quality genomic DNA or total RNA from microorganisms. A variety of microorganisms including gram negative and gram positive bacteria, bacterial spores, yeast and fungi have been tested successfully with these kits. Microbial cells are lysed using MO BIO's optimized bead beating technology, and nucleic acids are purified using a silica spin filter or spin plate.

UltraClean™ Microbial DNA Isolation Kit

Fig1. High-Quality DNA Purified from Various Microorganisms using the UltraClean™ Microbial DNA Isolation Kit.

Bacterial DNA
a: 1Kb ladder
b: *E. Coli*
c: *P. aeruginosa*
d: *S. aureus*
e: *M. tuteus*
f-: *B. subtilis*
g: *B. pumulis*
h: *E. faecalis*
i: *L. casei*

Fungal DNA
j: 1kb ladder
k: *A. niger*
l: *C. albicans*
m,n: *S. cerevisiae*

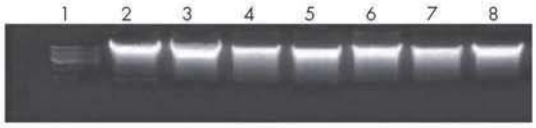

Fig2. Consistent DNA Yields with UltraClean-htp™ 96 Well Microbial DNA Kit. DNA was purified from various microorganisms and displayed on 1.2% TAE agarose gel.
1: Marker.
2: *E. coli*
3: *E. faecalis*
4: *B. Subtilis*
5: *P. fluorescens*
6: *C. albicans*
7: *C. albicans*
8: *S. cerevisiae*

UltraClean™ Microbial RNA Isolation Kit

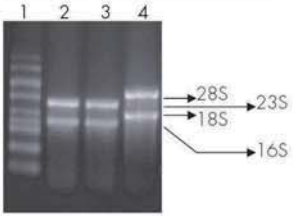

Fig3. Total RNA was purified from various microorganisms and displayed on a 1% formaldehyde agarose gel in MOPS buffer.
1: RNA ladder
2: *E. faecalis*
3: *B. subtilis*
4: *C. albicans*

PowerMag™ Microbial DNA Isolation Kit

NEW

The PowerMag™ Microbial DNA Isolation Kit is designed for automated isolation of high quality genomic DNA from pure microbial cultures, food cultures and swabs. Our unique SwiftMag™ Technology has been optimized for use with the Thermo Scientific KingFisher® Flex, KingFisher® Duo and the Eppendorf epMotion® 5075 TMX platforms, for rapid, high-throughput isolation of inhibitor-free DNA.

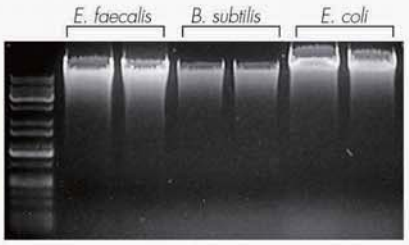

Figure 4. High quality DNA isolated from 1.8 ml of *E. faecalis, B. subtilis and E. coli* cultures using the PowerMag™ Microbial DNA Isolation Kit on the KingFisher® Duo. High quality, high molecular weight DNA was observed in replicate samples examined on a 1% agarose gel. No differences in yield or quality were observed between the replicate samples.

	UltraClean™ Microbial DNA Isolation Kits	UltraClean™ Microbial RNA Isolation Kit		PowerMag™ Microbial DNA Isolation Kit
Format	Silica Spin Filter Tubes	Silica Spin Filter Plates	Silica Spin Filter Tubes	Magnetic Particle Technology
Method	Bead Beating	Bead Beating	Bead Beating	Bead Beating
Binding Capacity	Up to 20 µg per well	Up to 20 µg per well	Up to 20 µg per filter	
Through-put	1-24 samples	96 samples	1-24 samples	96 samples
Time	20 minutes	1.5 hours	35 minutes	
Equipment Required	Microcentrifuge, Vortex, Vortex Adapter	Plate centrifuge, 96 Well Plate Shaker	Microcentrifuge, Vortex, Vortex Adapter	96 Well Plate Shaker, Centrifuge, Automated processing system.

Ordering Information

Catalog No.	Description	Quantity
12224-50	UltraClean™ Microbial DNA Isolation Kit	50 Preps
12224-100	UltraClean™ Microbial DNA Isolation Kit	100 Preps
12255-50	PowerLyzer™ UltraClean® Microbial DNA Isolation Kit	50 Preps
15800-50	UltraClean™ Microbial RNA Isolation Kit	50 Preps
15800-250	UltraClean™ Microbial RNA Isolation Kit	250 Preps
10196-4	UltraClean-htp™ 96 Well Microbial DNA Kit	4x96 Preps
10196-12	UltraClean-htp™ 96 Well Microbial DNA Kit	12x96 Preps
27200-4	PowerMag™ Microbial DNA Isolation Kit	4x96 Preps

Application Note

Isolation of Microbial DNA using the PowerLyzer™ UltraClean® Microbial DNA Isolation Kit

Vince Moroney and Suzanne Kennedy, Ph.D.
MO BIO Laboratories, Inc., 2746 Loker Avenue West, Carlsbad, CA 92010

Introduction

Isolation of genomic DNA from microbial species is best achieved using mechanical lysis with beads for the disruption of tough cell walls and spores. Optimal lysis for the purpose of isolating DNA can vary greatly based on the type of organism. The UltraClean® Microbial DNA Isolation Kit has previously been used for the isolation of bacteria from pure cultures using a vortex and a bead tube containing garnet sand along with a lysis chemistry that dissolves lipids and denatures proteins with excellent results. To provide an enhanced option for the lysis and isolation of DNA from microbes, MO BIO now offers the PowerLyzer™ UltraClean® Microbial DNA Isolation Kit, which provides the same superior chemistry for the purification of DNA but is combined with 0.1 mm glass bead tubes that are resistant to breakage under high velocity bead beating forces. The 0.1 mm glass beads in this kit are compatible with both vortex and high-powered bead beating methods, can enhance recovery of DNA from microorganisms with sturdy cell walls impervious to breakage, and are recommended whenever stronger lysis is necessary.

Methods

To demonstrate the isolation of DNA using a softer bead beating matrix and the hard glass beads, DNA was isolated from the gram positive bacteria *E. faecalis* because of its know resistance to lysis with conventional methods. DNA was isolated using the PowerLyzer™ UltraClean® Microbial DNA Isolation Kit (Cat. No. 12255-50) and the UltraClean® Microbial DNA Isolation Kit (Cat No. 12200-50) using the PowerLyzer™ 24 Homogenizer (Cat. No. 13155) at 2000 RPM for 5 minutes. Ten microliters of each eluate was electrophoresed on a 1% agarose gel (**Figure 1**).

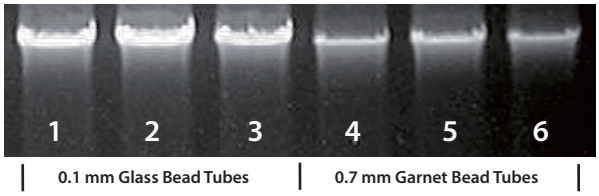

Figure 1. All samples were homogenized using the PowerLyzer™ 24 homogenizer for 5 minutes at 2000 RPM. Genomic DNA was isolated using either the PowerLyzer™ UltraClean® Microbial DNA Isolation Kit (lanes 1-3) or the UltraClean® Microbial DNA Isolation Kit (lanes 4-6).

Results

Efficient Isolation of DNA from Microbes using the PowerLyzer™ UltraClean® Microbial DNA Isolation Kit

DNA isolations from pure cultures of *Enterococcus* bacteria using the PowerLyzer™ UltraClean® Microbial DNA Isolation Kit which includes 0.1 mm glass bead tubes demonstrated higher yields than DNA isolated from pure cultures with the UltraClean® Microbial DNA Isolation Kit which includes 0.7 mm garnet beads.

Conclusions

Isolation of DNA from microorganisms can be achieved using multiple lysing methods. MO BIO now offers a complete system for the homogenization and isolation of DNA from pure microbes that are difficult to lyse. The PowerLyzer™ UltraClean® Microbial DNA Isolation Kit is designed to rapidly purify high quality genomic DNA from 1.8 ml microbial cultures in 20 minutes. By using heat, detergent, and mechanical force in 0.1 mm glass bead tubes with the PowerLyzer™ 24 homogenizer, even tough-to-lyse samples such as bacterial spores, yeast, fungi, and gram-negative and -positive bacteria are rapidly processed.

DNA

PowerFood™ Microbial DNA Isolation Kit

Pure DNA in fewer steps!

- ✓ **Optimized for tough samples** - Isolate DNA from bacteria (Gram + or -), yeast and fungi cultured from a variety of challenging food types
- ✓ **Inhibitor Removal Technology®** - Eliminates PCR inhibitors, resulting in DNA that is ready to use in PCR, qPCR and sequencing
- ✓ **Streamlined, Easy to Use Protocol** - Isolate high quality, pure DNA in just 30 minutes

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PowerFood™ Microbial DNA Isolation Kit

MO BIO Laboratories

Pure DNA in fewer steps!

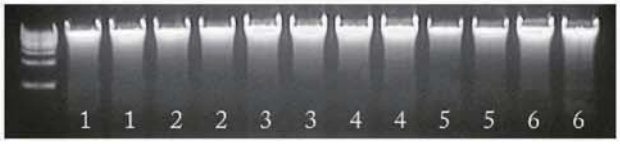
The PowerFood™ Microbial DNA Isolation Kit enables high quality, inhibitor-free DNA to be isolated directly from a primary food culture for faster, more reliable preliminary results using molecular detection methods.

DNA can be isolated from a variety of cultured food homogenates. Inhibitors from food particles and debris are removed from the sample during purification using patented Inhibitor removal Technology® (IRT). This results in high quality DNA that is ready for PCR, qPCR and restriction enzyme analysis.

Cpmpatible with FDA guidelines for a wide variety of food sources

The PowerFood™ Microbial DNA Isolation Kit has been validated with known food pathogens cultured in a variety of different solid and liquid food matrices according to FDA guidelines (Bacteriological Analytical Manual, Ed. 8, Revision A/1998) (Figure 1).

Gram -
L= MO BIO 1 kb DNA ladder*
1 = *E. coli*/strawberries/TSB
2 = *E. coli*/orange juice/TSB
3 = *E. coli* TSB culture control
4 = *S. enterica*/strawberries/TSB
5 = *S. enterica*/orange juice/TSB
6 = *S. enterica* TSB culture control



Gram +
L= MO BIO 1 kb DNA ladder*
7 = *C. perfringens*/carrot juice/RCM
8 = *C. perfringens*/raw ground beef/RCM
9 = *C. perfringens* RCM culture control
10 = *C. difficile*/ready-to-eat salad/RCM
11 = *C. difficile*/raw ground beef/RCM
12 = *C. difficile* RCM culture control

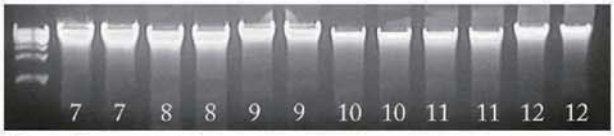


Figure 1. Genomic DNA from known pathogens cultured in various food homogenates. Samples were processed using a BagMixer® 400 (Interscience). DNA was isolated using PowerFood™ Microbial DNA Isolation Kit. 10 µl of isolated DNA was loaded into each well of a 1% agarose gel. RCM= Reinforced Clostridial Medium, TSB= Trypticase Soy Broth. *MO BIO 1 kb DNA ladder (catalog # 17200-100)

Accurate & sensitive qPCR Results

qPCR was used to assess inhibitor removal. Assays were performed using the Kapa SYBR Fast qPCR Kit and primers specific for *S. enterica* and *C. perfringens*. Removal of PCR inhibitors was demonstrated by correct estimation of the quantity of DNA based on the OD260 (Figures 2, 3).

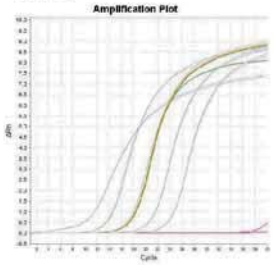


Figure 2. Detection of S. enterica cultured in orange juice and strawberries. The standard curve consisted of a 5 point, 10-fold dilution series of Salmonella DNA. Assay efficiency was 101%. 1 ng of DNA was used for template in each reaction and 1.17±0.04 ng was detected.

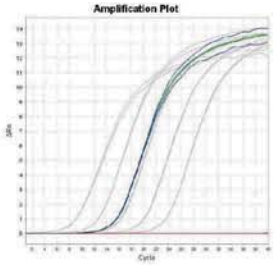
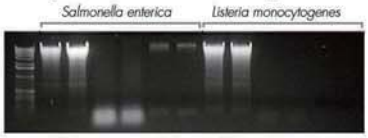


Figure 3. Detection of C. perfringens cultured in carrot juice and raw ground beef. The standard curve consisted of a 5 point, 10-fold dilution series of C. perfringens DNA. Assay efficiency was 90%. 1 ng of DNA was used for template in each reaction and 0.86±0.03 ng was detected.

Outperforms the Competition



In a comparison with two competitive kits (L & Q), the PowerFood™ Microbial DNA Isolation Kit (MB) gave the highest yields, quality and purity from cultured Brie Cheese.

Summary

Purification of microbial DNA from cultured food samples can be difficult due to inhibitors from various components such as pulp, fat, and sugars. The PowerFood™ Microbial DNA Isolation kit combines the robust and rapid lysis method of bead beating with patented Inhibitor Removal Technology® resulting in isolation of high quality, pure DNA from a variety of microorganisms cultured from food. Our stream-lined protocol with minimal steps makes processing easier and eliminates areas where mistakes can be introduced, resulting in reliable and sensitive pathogen detection.

NEW

For High-throughput Purification

PowerMag® Microbial DNA Isolation Kit

The PowerMag® Microbial DNA Isolation Kit is designed for automated isolation of high quality genomic DNA from pure microbial cultures, food cultures and swabs. Our unique SwiftMag® technology has been optimized for use with the Thermo Scientific KingFisher® Flex and Duo and the Eppendorf epMotion® 5075 TMX platforms, for rapid, high-throughput isolation of inhibitor-free DNA.

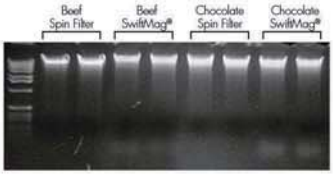


Figure 4. Listeria monocytogenes was grown overnight in a 10% ground beef (22% fat) or in 10% dark chocolate (86% cacao) culture. 1.8 ml of each culture was used for DNA isolation with the PowerFood™ Microbial DNA Isolation Kit (silica spin filter method) or the PowerMag® Microbial DNA Isolation Kit. Samples were examined on a 1% agarose gel and no difference was observed between DNA isolated using the silica spin filter versus SwiftMag® technology.

Order information

Catalog No.	Description	Quantity
21000-50	PowerFood™ Microbial DNA Isolation Kit	50 prep
21000-100	PowerFood™ Microbial DNA Isolation Kit	100 prep
27200-4	PowerMag® Microbial DNA Isolation Kit	4 x 96 preps

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QQ：1362545403

Application Note

Efficient DNA Extraction of Foodborne Pathogens (*Listeria monocytogenes, Escherichia coli*) at Low Concentrations in Difficult Food Matrices

Heather Callahan, Ph.D.
MO BIO Laboratories, Inc., 2746 Loker Avenue West, Carlsbad, CA 92010

Introduction

DNA isolation from foodborne pathogens can be inconsistent due to the complexity of food homogenates and extraction method used. Inhibitors such as polysaccharides, polyphenols, and lipids can adversely affect DNA recovery and downstream detection. Crude extraction methods are commonly employed along with reduced culture times in an effort to limit handling and time to accurate detection. However, without purification, crude extracts still contain inhibitors that can negatively impact the detection assay regardless of how robust it is. Here we evaluate a fast (<25 minutes) DNA extraction and purification method that utilizes Inhibitor Removal Technology® to allow for reliable pathogen detection and quantitative evaluation.

Materials

- PowerFood™ Microbial DNA Isolation Kit (Cat# 21000-50; MO BIO Laboratories, Inc.)
- BagMixer® 400 VW (Cat# 23112; MO BIO Laboratories, Inc.)
- BagFilter® 400 (Cat# 23114-500; MO BIO Laboratories, Inc.)
- Vortex-Genie® 2 (Cat# 13000-V; MO BIO Laboratories, Inc.)
- Votex Adapter (Cat# 13000-V1-24; MO BIO Laboratories, Inc.)
- Soybean-Casein Digest Medium, TSB (Cat# 12114-05; MO BIO Laboratories, Inc.)
- Soybean-Casein Digest Agar Medium, TSA (Cat# 12115-05, MO BIO Laboratories, Inc.)
- KAPA SYBR® Fast Universal 2X qPCR Master Mix (Cat# 51230-500; MO BIO Laboratories, Inc.)
- QuickScan™ qPCR Test Kit – *Listeria monocytogenes* (Cat# 20-LM-001, BioVisible)
- QuickScan™ qPCR Test Kit – *Escherichia coli* (Cat# 20-ES 001, BioVisible)
- Oligos – *L. monocytogenes* (Sigma-Aldrich™)[1]
- StepOne™ Real-Time PCR System (Applied Biosystems)
- 80% lean ground beef (Stater Bros.)
- Brie cheese, double cream (Trader Joe's)
- *E. coli* stock culture
- *L. monocytogenes* stock culture

Methods

Evaluation of DNA preparation methods

1) 10 g of Brie cheese was homogenized in 90 ml of TSB using the BagMixer® 400 VW. *L. monocytogenes* was added and grown overnight at 37°C. DNA was extracted using the PowerFood™ Microbial DNA Isolation Kit, a crude extraction kit (Competitor AB), or a purification kit without inhibitor removal (Competitor Q) according to each manufacturer's protocol. DNA was also isolated from a pure culture to generate the standard curve for qPCR.

2) 1 ng of each template, representing ~3 x 10^5 CFU was combined with the KAPA SYBR® Fast Universal Master Mix and 200 nM of the QuickScan™ qPCR *L. monocytogenes* primers. Reaction conditions were programmed as recommended and analyzed using the StepOne™ Real-Time PCR System.

Evaluation of DNA extraction efficiency and detection

1) 5 ml of overnight bacterial cultures were re-inoculated in 100 ml of TSB and grown to mid log phase (OD_{600} = 0.04). Cultures were serially diluted and 100 µl spiked into 1.7 ml of either TSB or a 1:10 dilution of ground beef or brie cheese homogenized in TSB using the BagMixer® 400 VW. Total CFUs were determined for all spiked homogenates by plating on TSA.

2) DNA was isolated from TSB and the food homogenates in duplicate using the PowerFood™ Microbial DNA Isolation Kit. DNA was also isolated from the overnight pure cultures to generate the standard curves for qPCR. Extraction controls were included.

3) 1 µl of each template was combined with the KAPA SYBR® Fast Universal Master Mix and 200 nM of either the QuickScan™ qPCR *E. coli* primers or the published *L. monocytogenes* primers[1]. Reactions conditions were programmed as recommended and analyzed using the StepOne™ Real-Time PCR System.

Results

More than a 7-cycle difference (>100 fold improvement) in detection of *L. monocytogenes* occurred between the PowerFood™ kit and the competitor's kits indicating that the best detection levels are achievable when DNA is both purified and free of inhibitors (**Figure 1**).

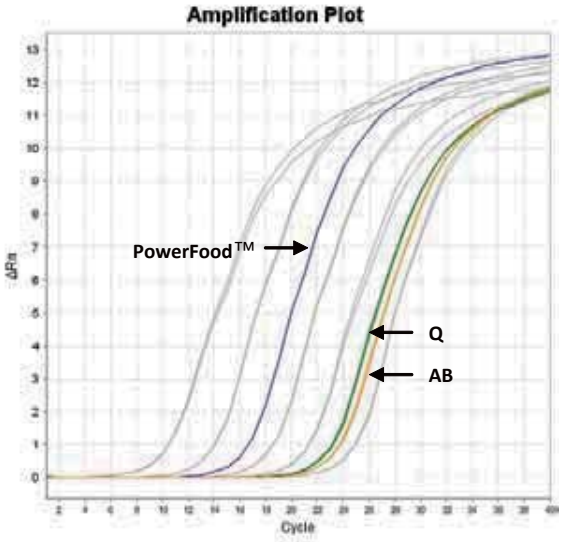

Figure 1. Detection of 3 x 10^5 CFU after DNA extraction using purified/IRT treated (PowerFood™), purified/non-treated (Competitor Q), or crude (Competitor AB) preparation methods. Assay efficiency was 89%. Standard curve (gray), PowerFood™ (blue), Competitor Q (green), Competitor AB (orange).

Reliable DNA isolation and detection of *L. monocytogenes* was obtained down to 80 CFUs (**Figure 2**). There was also consistent agreement between the brie cheese extractions and the controls (TSB), indicating effective and complete inhibitor removal (**Table 1**). Results for *E. coli* were also very consistent between DNA extracted from 80% lean ground beef and pure TSB cultures (**Figure 3**).

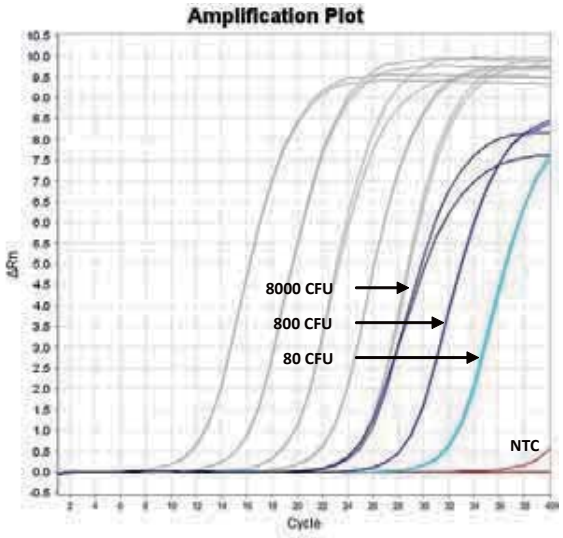

Figure 2. Detection of *L. monocytogenes* isolated from Brie cheese using the PowerFood™ Microbial DNA Isolation Kit. Assay efficiency was 105%. Lower dilutions and extraction controls were at Ct > 32 and were considered beyond the detection level of the assay. Standard curve (gray), bacterial dilutions (blue), non template control (red).

Sample	Ct (Mean)	Ct (Std Dev)
8000 CFU – Brie	22.30	0.17
– TSB	22.53	0.19
800 CFU – Brie	25.76	0
– TSB	25.89	0.05
80 CFU – Brie	29.42	0.06
– TSB	29.57	0.47

Table 1. Mean Ct and Standard Deviation for *L. monocytogenes* isolated from either Brie cheese or TSB.

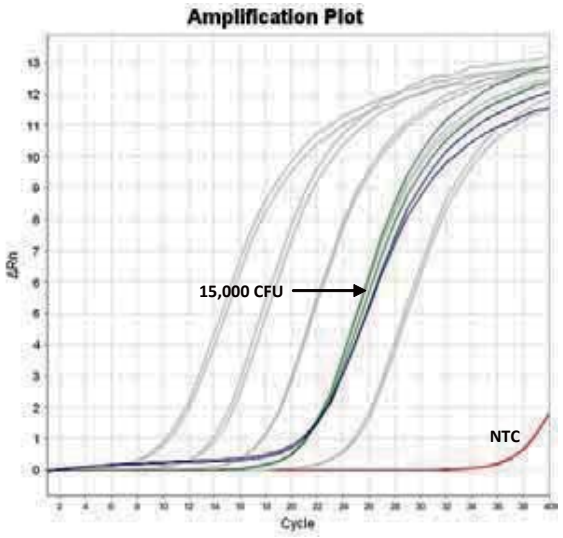

Figure 3. Detection consistency of *E. coli* isolated from 80% lean ground beef and TSB using the PowerFood™ Microbial DNA Isolation Kit. Standard curve (gray), beef (blue), TSB (green), non template control (red).

Summary

Removing PCR inhibitors from complex food matrices is challenging and can influence assay detection limits. The PowerFood™ Microbial DNA Isolation Kit is a reliable method for DNA isolation and purification of both Gram + and Gram – organisms from difficult food homogenates and low bacterial concentrations. By utilizing patented Inhibitor Removal Technology® and spin column purification, extraction efficiencies are both consistent and high, leading to improved downstream detection.

References

1. Rodríquez-Lázaro, D et al. 2004. App Env Microbiol 70(3): 1366-1377.

DNA

PowerMag® Microbial DNA Isolation Kit

Magnetize your Research with SwiftMag® Technology

✓ **Optimized for tough samples -** Automated isolation of high quality DNA from pure microbial cultures, food cultures and swabs

✓ **SwiftMag® Technology -** Optimized for use with KingFisher® and epMotion® automated processing systems for rapid and hands-free DNA isolation

✓ **Inhibitor Removal Technology®-** Removes PCR-inhibiting compounds associated with microbial and food cultures, including lipids and polysaccharides

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PowerMag® Microbial DNA Isolation Kit

Magnetize your Research

Description

The PowerMag® Microbial DNA Isolation Kit is designed for automated isolation of high quality genomic DNA from pure microbial cultures, food cultures and swabs. A variety of microorganisms, including bacterial spores, fungal types, and food cultures from meats, dairy products, chocolate, fruits and vegetables have been tested successfully with this kit. The protocol is designed for isolation of DNA from up to 1.8 ml of culture and includes patented Inhibitor Removal Technology® (IRT) to remove PCR-inhibiting compounds associated with microbial and food cultures, including lipids and polysaccharides. Our unique SwiftMag® technology has been optimized for use with the Thermo Scientific KingFisher® Flex and Duo and the Eppendorf epMotion® 5075 TMX platforms, for rapid, high-throughput isolation of inhibitor-free DNA. The high-quality DNA isolated with the PowerMag® Microbial DNA Isolation Kit is ready to use in PCR, qPCR and next generation sequencing.

Figure 1. High quality DNA isolated from 1.8 ml of *E. faecalis* culture using the PowerMag® Microbial DNA Isolation Kit on the epMotion® 5075 TMX. High quality, high molecular weight DNA was observed in eight replicate samples examined on a 1.2% agarose gel. No differences in yield or quality were observed between the replicate samples.

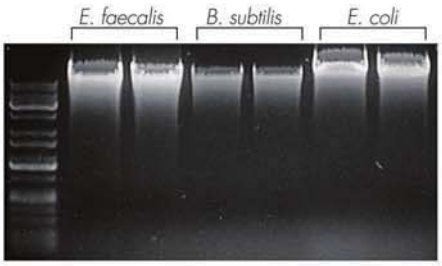

Figure 2. High quality DNA isolated from 1.8 ml of *E. faecalis*, *B. subtilis* and *E. coli* cultures using the PowerMag® Microbial DNA Isolation Kit on the KingFisher® Duo. High quality, high molecular weight DNA was observed in replicate samples examined on a 1% agarose gel. No differences in yield or quality were observed between the replicate samples.

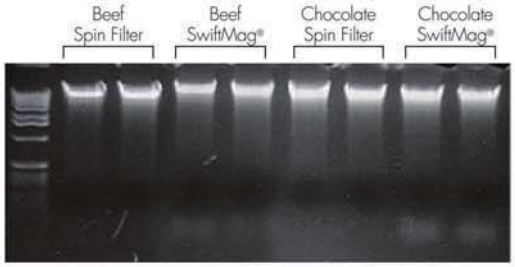

Figure 3. *Listeria monocytogenes* was grown overnight in a 10% ground beef (22% fat) or in 10% dark chocolate (86% cacao) culture. 1.8 ml of each culture was used for DNA isolation with the PowerFood™ Microbial DNA Isolation Kit (silica spin filter method) or the PowerMag® Microbial DNA Isolation Kit. Samples were examined on a 1% agarose gel and no difference was observed between DNA isolated using the silica spin filter versus SwiftMag® technology.

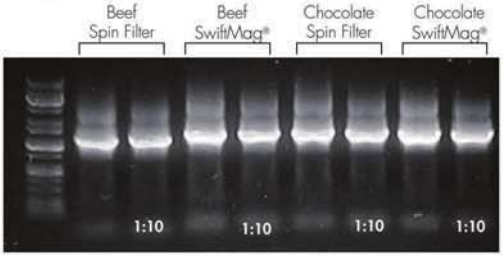

Figure 4. 16S rDNA universal primers were used with the Kapa2G Fast HotStart ReadyMix for endpoint PCR. 1 µl of each sample described in Figure 3 was used along with a 1:10 dilution to check for amplification inhibition. All samples amplified successfully.

Specifications

Format	SwiftMag® Technology
Method	Bead Beating
Starting Amount	1.8ml
Throughput	96 well plate
Equipment Required	• Plate Shaker for homogenization of samples in 96 well blocks (recommended: MO BIO Catalog# 11996) • Centrifuge capable of handling two 96 well blocks • KingFisher® Flex or Duo Magnetic Particle Processor, or epMotion® 5075 TMX Automated Pipetting System • Magnetic Separator (PowerMag® Magnetic Separator, Catalog # 27400 required for use with epMotion® system)
Additional Items Required	PowerMag® epMotion® Accessory Pack, Catalog # 27300-4-EP (required for use with epMotion® system)

Catalog No.	Description	Quantity
27200-4	PowerMag® Microbial DNA Isolation Kit	4 x 96 Preps
27300-4-EP	PowerMag® epMotion® Accessory Pack	1 Pack
27400	PowerMag® Magnetic Separator	1 Unit

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QQ:1362545403

PowerPlant® Pro DNA
PowerPlant® RNA Isolation Kits

High yields of uninhibited nucleic acids

DNA/RNA

- ✓ **Optimized for Tough Samples -** Isolate DNA and RNA from the most difficult plant types, including strawberry leaf, cotton leaf, cotton seeds and pine needles
- ✓ **Inhibitor Removal Technology® -** Removes 100% of polyphenolics, polysaccharides and other PCR inhibitors
- ✓ **Phenolic Separation Solution -** Increases Nucleic Acid yield in high-phenolic samples
- ✓ **Rapid Protocol -** Isolate nucleic acids in 30 minutes without the use of harsh chemicals

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PowerPlant® Pro DNA and PowerPlant® RNA Isolation Kits

High yields of uninhibited nucleic acids

Description

The PowerPlant® Pro DNA and PowerPlant® RNA Isolation Kits are designed for fast and easy purification of nucleic acids from plant cells, tissues and seeds. The optimized bead beating technology replaces time consuming isolation procedures such as CTAB, phenol, or chloroform extraction for recovery of high quality nucleic acids from the toughest sample types, including strawberry leaf, cotton leaf, cotton seeds, and pine needles. MO BIO patented Inhibitor Removal Technology® (IRT) is used for removal of PCR inhibitors from plant extracts during the isolation process, resulting in pure DNA or RNA that is ready to use in downstream applications including PCR, qPCR and sequencing. In addition, a unique Phenolic Separation Solution (PSS) is included as an optional step for samples high in polyphenolic compounds, such as pine needles and grape leaf. PSS breaks the bond between nucleic acids and phenolics, increasing the yield of DNA or RNA. PowerPlant® RNA Isolation Kits are available with or without the reagents to perform an on-column DNase treatment to remove co-isolated genomic DNA.

The PowerPlant® Pro DNA and PowerPlant® RNA Isolation Kits may be used with a vortex (for soft leaf tissue) or high velocity bead beater, such as the PowerLyzer™ 24 homogenizer. The PowerLyzer™ 24 is suitable for rapid homogenization of plant materials including stems, roots, seeds or difficult leaf tissue.

Fig 1. Isolation of high quality genomic DNA from plant samples using the PowerPlant® Pro DNA Isolation Kit. DNA isolated from grass (2 µl), strawberry leaf (15 µl), grape leaf (15 µl) and pine needles (1µl) was examined on a 1% TAE agarose gel.

Fig 2. The PowerPlant® Pro DNA Isolation Kit provides greater yields of high molecular weight genomic DNA. DNA was isolated from cotton seed using the PowerPlant® Pro DNA Isolation Kit and plant DNA isolation kits from three other suppliers. All isolations were performed according to the manufacturer's protocol. DNA (2% of elution volume) was examined on a 1% TAE agarose gel.

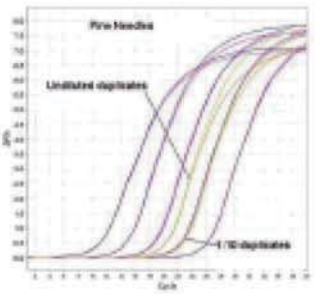

Fig 3. Successful amplification of DNA isolated using the PowerPlant® Pro DNA Isolation Kit. qPCR was performed using primers for RuBisCo on 1 ng of DNA isolated from pine needles. Undiluted DNA and samples diluted 1:10 fell within the standard curve (purple lines), and the difference between the diluted and undiluted samples was approximately 3 cycles, indicating the DNA is free of inhibitors.

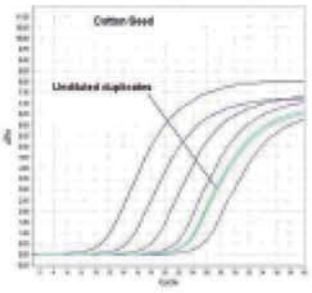

Fig 4. Successful amplification of RNA isolated using the PowerPlant® RNA Isolation Kit. RT-qPCR was performed using primers for RuBisCo on 1 ng of RNA isolated from cotton seed. Samples fell within the standard curve (blue lines). Duplicate samples amplified at the same Cq, demonstrating purity and consistency between preps.

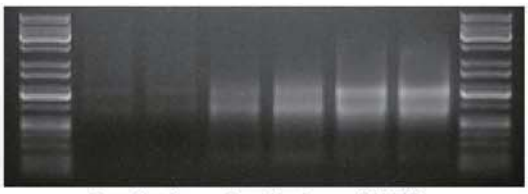

Fig 5. The PowerPlant® RNA isolation kit provides higher yields of intact RNA. Total RNA was isolated from cotton seed using the PowerPlant® RNA Isolation Kit and plant RNA isolation kits from two other suppliers. All isolations were performed according to the manufacturer's protocol. RNA samples (2 µl) were examined on a 1% TAE agarose gel.

Specifications

Format	Silica Spin Filter
Method	Bead Beating
Starting Amount	Up to 50 mg
Binding Capacity	Up to 40 µg per spin filter
Throughput	1 - 24 samples
Time	30 minutes
Equipment Req'd	Vortex and Adapter* or PowerLyzer™ 24 Centrifuge

Order information

Catalog No.	Description	Quantity
13400-50	PowerPlant® Pro DNA Isolation Kit	50 preps
13500-50	PowerPlant® RNA Isolation Kit	50 preps
13550-50	PowerPlant® RNA Isolation Kit with DNase	50 preps

深圳市安必胜科技有限公司

PowerMag™ Seed DNA Isolation Kit

Magnetize Your Research

DNA

- ✓ **Optimized lysis for tough samples** – Isolate high quality DNA from the most challenging seed types
- ✓ **ClearMag™ Technology** – Novel magnetic particle technology captures DNA without binding organic inhibitors, facilitating isolation of pure DNA
- ✓ **Hands-free purification** - Optimized for use with KingFisher® automated processing systems
- ✓ **Inhibitor Removal Technology®** - Removes PCR-inhibiting compounds associated with seeds, including polysaccharides and polyphenolics

www.mobio.com.cn | Tel: 0755-83489872 | email: anbiosci@126.com | QQ: 1362545403

PowerMag™ Seed DNA Isolation Kit

MO BIO Laboratories

Magnetize Your Research

Description

The PowerMag™ Seed DNA Isolation Kit is designed for fast and easy purification of nucleic acids from all seed types. The optimized bead beating technology (optional) replaces cumbersome isolation procedures such as CTAB, phenol, or chloroform extraction for recovery of high quality nucleic acids from the toughest seed types, including flax, wheat, canola, corn and barley. Patented Inhibitor Removal Technology® (IRT) is used for removal of PCR inhibitors from seed extracts during the isolation process. Additionally, a unique Phenolic Separation Solution (PSS) is included as an optional step for seeds high in polyphenolic compounds, such as cotton, watermelon, and bell pepper seeds. PSS breaks the bond between nucleic acids and phenolics, increasing the DNA yield.

Novel ClearMag™ technology enables purification of DNA without the typical surface binding to the beads, eliminating the adsorption of organic inhibitors that is typical of other magnetic bead technologies, and facilitating isolation of pure DNA. In addition, neither chaotropic salts nor ethanol are used in the binding and washing steps, removing a second source of contamination that can inhibit enzymatic reactions. The PowerMag™ Seed DNA Isolation Kit has been optimized for use with the Thermo Scientific KingFisher® Flex and Duo for rapid, high-throughput isolation of inhibitor-free DNA. The high-quality DNA isolated with the PowerMag™ Seed DNA Isolation Kit is ready to use in PCR, qPCR and next generation sequencing.

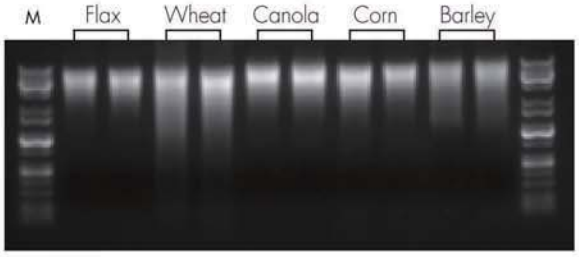

Figure 1. High quality, pure DNA was isolated from duplicate samples of flax seeds (25 mg with seed coat removed), wheat seeds (45 mg), canola seeds (10 whole seeds, 50 mg), corn kernels (50 mg), and barley seeds (50 mg) using the PowerMag™ Seed DNA Isolation Kit. High quality, high molecular weight DNA was observed on a 1.2% TAE agarose gel. No differences in yield or quality were observed between the duplicate samples. DNA yields are shown in Table 1.

Table 1. High yields of DNA isolated from seeds described in Figure 1.

Seed Type	Concentration (ng/µl)
Flax	21.65
Wheat	49.97
Canola	25.72
Corn	37.76
Barley	67.20

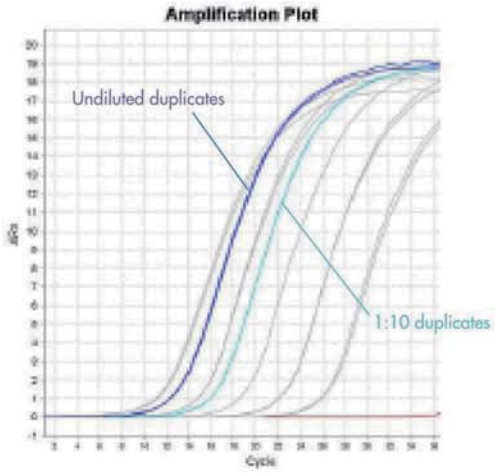

Figure 2. Successful amplification of DNA isolated from flax seeds using the PowerMag™ Seed DNA Isolation Kit. qPCR was performed on duplicate samples using the Universal Plant (Rubisco) assay. For samples isolated using the PowerMag™ Seed Kit, undiluted DNA (1 µl of elution) and samples diluted 1:10 fell within the standard curve (grey lines), and the difference between the diluted and undiluted samples was approximately 3 cycles, indicating the DNA was free of inhibitors. There was no difference in Cq value between the duplicate samples.

Specifications

Format	ClearMag™ Technology
Method	Bead Beating
Starting Amount	25 – 50 mg
Throughput	96 well plate
Equipment Required	• Plate Shaker for homogenization of samples in 96 well blocks (recommended: MO BIO Catalog# 11996) • Centrifuge capable of handling two 96 well blocks • KingFisher® Flex or Duo Magnetic Particle Processor

Order information

Catalog No.	Description	Quantity
27700-4-KF	PowerMag™ Seed DNA Isolation Kit (Optimized for KingFisher®)	4 x 96 preps

www.mobio.com.cn
Tel: 0755-8348 9872
Fax: 0755-8348 9700
QQ: 1362545403

PowerBiofilm™
DNA & RNA Isolation Kits

DNA & RNA

No microbe will be left unsequenced

- ✓ **Complete lysis** of extracellular polymeric substances using a biofilm pretreatment and optimized bead beating method
- ✓ **Inhibitor Removal Technology®** removes humic substances and other PCR inhibitors including metals, salts and pesticides
- ✓ **Compatible with the toughest biofilms** from dental plaques to microbial mats
- ✓ **Rapid protocol** enables isolation of high quality nucleic acids in just 25 minutes

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PowerBiofilm™ DNA & RNA Isolation Kits

Application Note

Improved DNA and RNA Isolation from Biofilms

Heather Callahan, Ph.D.
MO BIO Laboratories

Introduction

Biofilms are composed of bacteria irreversibly attached to a substrate by extracellular polymeric substances or EPS. Within this EPS matrix, a number of compounds can be found including humic substances, metals, salts, and pesticides. As a result, microbes within a biofilm are difficult to lyse and the nucleic acids, once purified may still contain inhibitory substances. When working with biofilms, traditional methods of nucleic acid purification in conjunction with commercial kits are commonly employed and often include a pretreatment to reduce EPS and increase cell lysis and overall nucleic acid yield. However, these protocols can take several hours to days to complete. The PowerBiofilm™ DNA Isolation Kit and PowerBiofilm™ RNA Isolation Kit from MO BIO Laboratories, combines biofilm pretreatment and improved cell lysis with patented Inhibitor Removal Technology® to yield consistent, high quality, inhibitor free DNA and RNA .

EPS Removal and Lysis Optimization

One of the most difficult aspects of nucleic acid isolation and purification from biofilms is ensuring complete lysis of the microbial community in the presence of EPS. For effective and complete lysis to occur the EPS must be degraded. EPS degradation can be achieved a number of ways using chemical, mechanical, or enzymatic means. The PowerBiofilm™ kits use a combination of several methods to dissolve the EPS, which in turn fully exposes the microbes to the lysis buffers. Both the PowerBiofilm™ DNA and RNA kits contain a special bead tube mix, standard lysis buffer and a lysis enhancement buffer to ensure optimal lysis of the microbial community (Figures 1, 2).

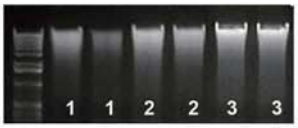


Figure 1. Genomic DNA isolated from 0.15 g of phototrophic mat during PowerBiofilm™ DNA Isolation Kit development. 1, standard glass bead tube mix; 2, PowerBiofilm™ bead tube mix; 3, PowerBiofilm™ bead tube mix with BF2 (lysis enhancement buffer). Variation 3 represents the final chemistry of the kit.

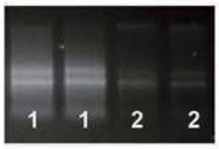


Figure 2. Total RNA isolated from 0.15 g of an inhibitor rich lagoon biofilm sample using the PowerBiofilm™ RNA Isolation Kit. 1, PowerBiofilm™ bead tube mix with BFR2 (lysis enhancement buffer); 2, Standard glass bead tube mix without BFR2.

Inhibitor Removal

Even with efficient lysis, degraded EPS and other organic/inorganic compounds can carry over through purification and inhibit downstream applications of nucleic acids. To prevent this, both the PowerBiofilm DNA and PowerBiofilm RNA Isolation Kits contain patented Inhibitor Removal Technology® (IRT) which has been shown to remove humic substances, polysaccharides, and polyphenolics from nucleic acid preps (www.mobio.com/references).

Sample Validation

Biofilms occur virtually everywhere and are as diverse as the microbes that create them. Therefore, a wide range of biofilm types have been evaluated both at MO BIO and by outside collaborators (Tables 1, 2). High DNA and RNA yielding biofilms were tested as well as low yielding microbial mats.

Biofilm Type	Sample Amount (g)	DNA Yield (ng/µl)	Data
Sink Pipe	0.20	94 -198	
Lagoon Rocks	0.15	100 -150	
Phototrophic Biofilm (Microbial Mat)	0.15 0.10 0.05	54 -13 70 -76 37 - 50	
Stream Rocks	<0.05	4 - 11	*Data courtesy of A.J. Gildemeister University of Sterling*
Bioreactor	0.25	56 - 130	*Data courtesy of J. Moore-Kucera Texas Tech University*
Button Thrombolites (Microbial Mat) *Samples courtesy of J. Foster University of Florida*	0.25	1 - 15	
Gypsum Crust	0.20	15 - 28	*Data courtesy of B. Camara & A. Gorbushina Federal Institute for Material Research and Testing Berlin, Germany*

Table 1. PowerBiofilm™ DNA Isolation Kit yields from biofilm and microbial mats. Data was generated by both MO BIO Laboratories and collaborators as indicated.

Biofilm Type	Sample Amount (g)	RNA Yield (ng/µl)	Data
Lagoon Rocks	0.20	37 - 60	
Phototrophic Biofilm (Microbial Mat)	0.10 - 0.15	10 - 100	
Button Thrombolites (Microbial Mat)	0.25	1 - 17	*Data courtesy of J. Foster University of Florida*
Deep Sea Microbial Mat *Data courtesy of P.D. Courtway and D.A. Caron University of Southern California*	0.20 – 0.30	11 - 35	

Table 2. PowerBiofilm™ RNA Isolation Kit yields from biofilm and microbial mats. Data was generated by both MO BIO Laboratories and collaborators as indicated.

Summary

The PowerBiofilm™ DNA and PowerBiofilm™ RNA Isolation Kits are the first of their kind developed to isolate high quality, inhibitor free DNA and RNA from biofilm samples including microbial mats. Sample pretreatment combined with a novel lysis mix and our patented Inhibitor Removal Technology® results in optimal nucleic acid yields that are free of inhibitors and ready to be used in all downstream applications.

Order information

Catalog No.	Description	Quantity
24000-50	PowerBiofilm™ DNA Isolation Kit	50 preps
25000-50	PowerBiofilm™ RNA Isolation Kit	50 preps

DNA

MO BIO Laboratories, Inc.

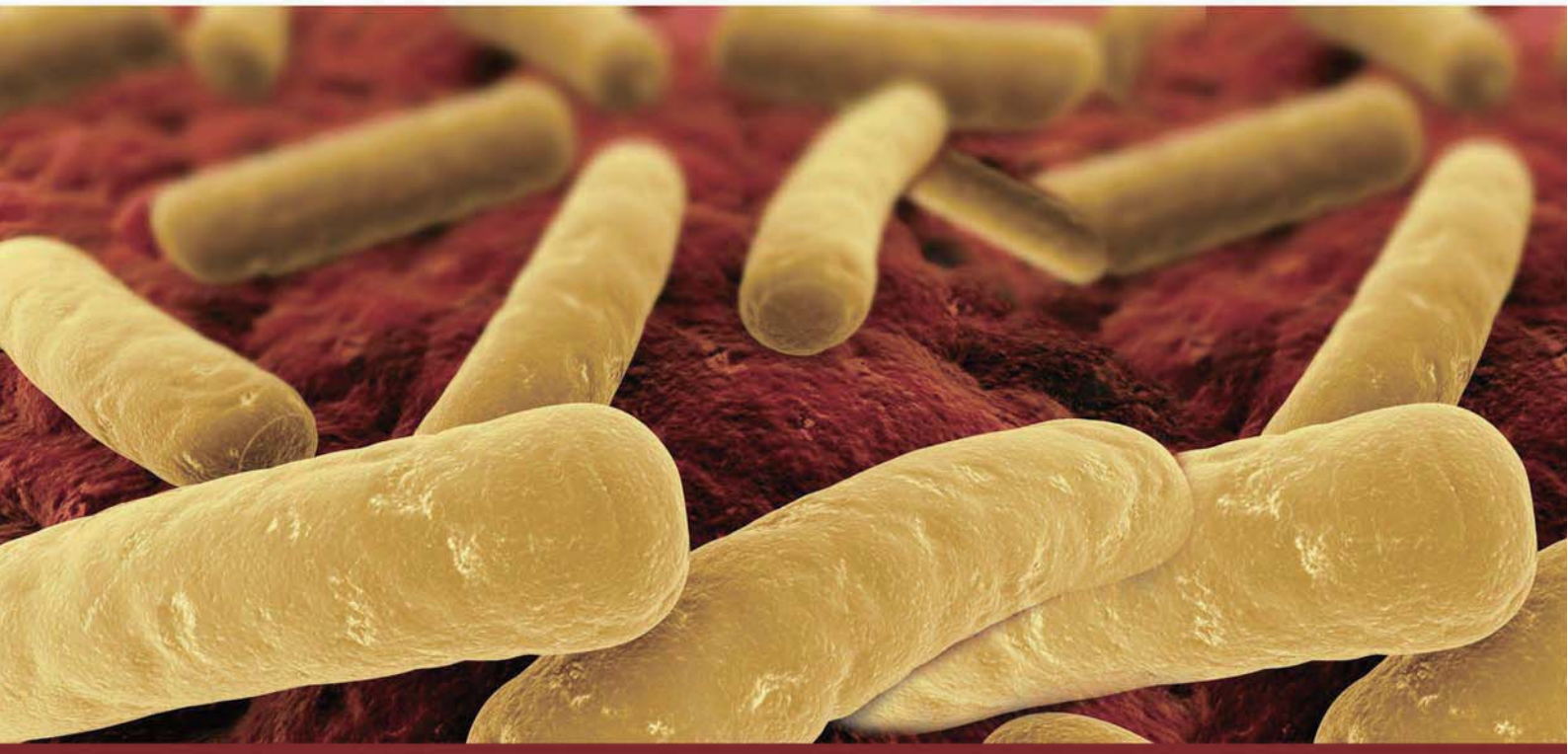
PowerFecal™ DNA Isolation Kit

Get your research moving

✓ **Optimized lysis for tough samples** – Isolate pure DNA from stool, gut material, and biosolids

✓ **Inhibitor Removal Technology®** – Eliminates inhibitory substances, including lipids, polysaccharides and heme, for DNA that is ready to use in PCR, qPCR and next generation sequencing

✓ **Rapid protocol** – Enables isolation of high quality, pure DNA from 250 mg samples in just 30 minutes



PowerFecal™ DNA Isolation Kit

MO BIO Laboratories

Get your research moving

Description

The PowerFecal™ DNA Isolation Kit is designed for fast and easy purification of DNA from samples high in PCR inhibitors; including stool, gut material, and biosolids. Patented Inhibitor Removal Technology® (IRT) ensures complete removal of inhibitory substances from digested food, heme from lysed red blood cells abundant in stool, and other PCR inhibitors. The DNA isolated is high quality and ready to use in the most demanding downstream applications, including PCR, qPCR and next generation sequencing.

The PowerFecal™ DNA Isolation Kit can be used interchangeably with the PowerSoil® DNA Isolation kit (Catalog # 12888-50 and 12888-100) – both kits can be used to isolate DNA from soil, environmental, stool, gut and biosolid samples. The PowerFecal™ DNA Isolation Kit protocol includes steps optimized for fecal samples, and bead tubes included in this kit are provided separetly from bead solution to accomodate samples with increased liquid volume.

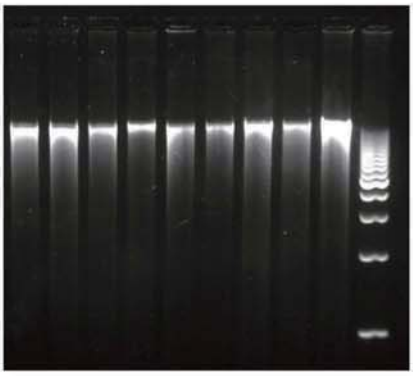


Figure 1. High quality DNA was isolated from neonate stool samples using the PowerFecal™ DNA Isolation Kit. Nine DNA samples isolated from neonate stool were examined on a 1% agarose gel and then used for metagenomic sequencing with Illumina HiSeq technology. Very good depth and quality were observed, indicating pure DNA (data not shown). Data courtesy of B. Firek, University of Pittsburgh School of Medicine, Pittsburgh, PA.

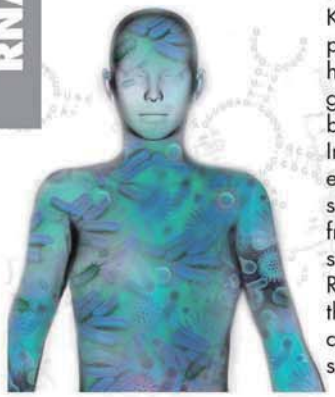
Specifications

Format	Silica Spin Filter Tubes
Method	Bead Beating
Binding Capacity	Up to 20 µg per filter
Throughput	1 - 24 samples
Time	30 minutes
Starting Amount	0.25 g of solid material or 200 µl of liquid
Equipment Required	Vortex and Vortex Adapter

Other solutions for Microbiome Research

PowerMicrobiome™ RNA Isolation Kit

RNA



The PowerMicrobiome™ RNA Isolation Kit is designed for fast and easy purification of total RNA from samples high in PCR inhibitors; including stool, gut material, dried feces, contaminated buccal swabs, and secretions. Patented Inhibitor Removal Technology® (IRT) ensures complete removal of inhibitory substances from digested food, heme from lysed red blood cells abundant in stool, and other PCR inhibitors. Isolated RNA is high quality and ready to use in the most demanding downstream applications, including RT-qPCR and sequencing.

PowerMag® Microbiome RNA/DNA Isolation Kit

High-throughput

The PowerMag® Microbiome RNA/DNA Isolation Kit is designed for automated isolation of nucleic acids from stool, biosolids and gut material. The protocol is designed for isolation of RNA and DNA from up to 0.25 g of sample and includes patented Inhibitor Removal Technology® to remove lipids, polysaccharides, heme and other PCR inhibitors.

Novel ClearMag® magnetic particle technology enables purification of RNA and DNA without the typical surface binding to the beads, eliminating the adsorption of organic inhibitors that is typical of other magnetic bead technologies, and facilitating isolation of pure nucleic acids. In addition, neither chaotropic salts nor ethanol are used in the binding and washing steps, removing a second source of contamination that can inhibit enzymatic reactions.

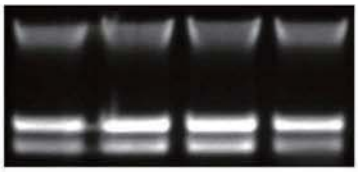


Figure 1. High quality, intact RNA was isolated from samples (0.25 g) spiked with Enterococcus using the PowerMag® Microbiome RNA/DNA Isolation Kit on the epMotion® 5075 TMX. No differences in yield or quality were observed between the four replicate samples.

Order information

Catalog No.	Description	Quantity
12830-50	PowerFecal™ DNA Isolation Kit	50 preps
26000-50	PowerMicrobiome™ RNA Isolation Kit	50 preps
27500-4-EP	PowerMag® Microbiome RNA/DNA Isolation Kit (Optimized for epMotion®)	4 x 96 preps
27600-4-KF	PowerMag® Microbiome RNA/DNA Isolation Kit (Optimized for KingFisher®)	4 x 96 preps

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QQ：1362545403

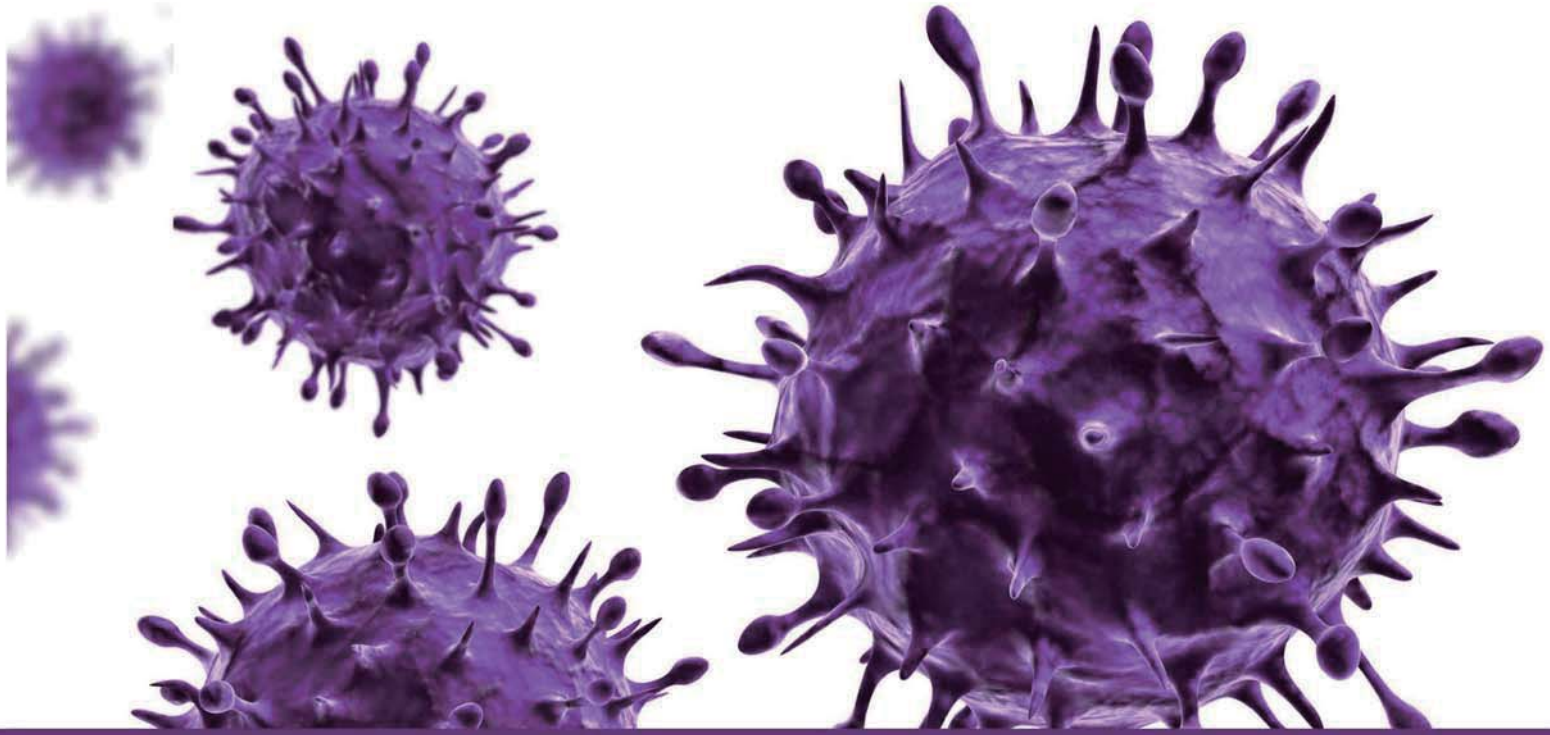
MO BIO Laboratories, Inc.

DNA & RNA

PowerViral™ Environmental RNA/DNA Isolation Kit

Cruise through your viral nucleic acid isolation

- ✓ **Optimized for challenging samples** – Isolate viral and bacterial RNA & DNA from waste water, stool, biosolids and gut material
- ✓ **Inhibitor Removal Technology®** – Eliminates inhibitory substances, including polysaccharides, lipids and heme for pure nucleic acids that are ready to use in downstream applications
- ✓ **Optional bead beating protocol** – Available with Glass Bead Tubes for optimal lysis of solid samples and bacterial cells or without bead tubes for isolation of viral nucleic acids from liquid samples



PowerViral™ Environmental RNA/DNA Isolation Kit

MO BIO Laboratories

Cruise through your viral nucleic acid isolation

Description

The PowerViral™ Environmental RNA/DNA Isolation Kit is designed for fast and easy purification of viral and bacterial total nucleic acids from samples high in PCR inhibitors; including waste water, stool, biosolids, and gut material. Patented Inhibitor Removal Technology® (IRT) ensures complete removal of the inhibitory substances often contained in these materials, such as undigested plant material in the gut or heme compounds from lysed red blood cells, abundant in stool. The result is pure DNA and RNA that is ready to use in the most demanding downstream applications. Nucleic acids are eluted in RNase-Free Water and ready for PCR, cDNA synthesis, RT-qPCR and more.

For stool samples or samples with a solid matrix, lysis is achieved using 0.1 mm Glass Bead Tubes, in combination with a strong chemical lysis buffer that ensures efficient extraction of tough microorganisms in the bead beating step. For viral nucleic acid extraction from water samples and samples that do not require dispersion, the bead beating step may be skipped and viral nucleic acids extracted through chemical lysis only. If lysis with Glass Bead Tubes is required, purchase Catalog # 28000-BUNDLE, which contains the PowerViral™ Environmental RNA/DNA Isolation Kit plus 0.1 mm Glass Bead Tubes. Otherwise, purchase Catalog # 28000-50 which is the PowerViral™ Environmental RNA/DNA Isolation Kit alone.

If additional DNase treatment is required, we recommend the RTS DNase™ Kit, Catalog # 15200-50.

Fewer inhibitors and higher yields

Data courtesy of B. Iker, University of Arizona, Tucson, AZ.

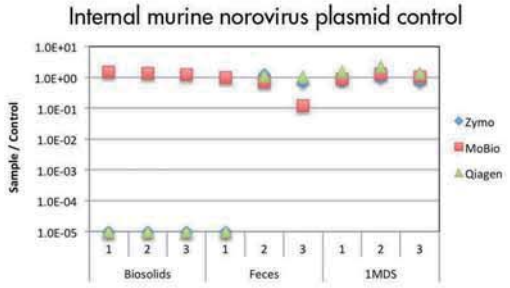


Figure 1. Fewer inhibitors were detected in nucleic acid samples isolated using the PowerViral™ Environmental RNA/DNA Isolation Kit. Assessment of the presence of qPCR inhibitors in the nucleic acid extracts from three separate extraction kits was performed via a qPCR inhibition test using an internal murine norovirus plasmid (pMNV) control (1.0×10^5 copies/PCR tube) in the presence of 2.5 µl of nucleic acid extract. Three samples (1, 2, and 3 on the horizontal axis) for each type of environmental sample matrix (biosolid extracts, fecal suspensions, and 1MDS surface water concentrates) were tested. Only PowerViral™ Environmental RNA/DNA Isolation Kit demostrates better purification accross all sample types.
Data courtesy of B. Iker, University of Arizona, Tucson, AZ.

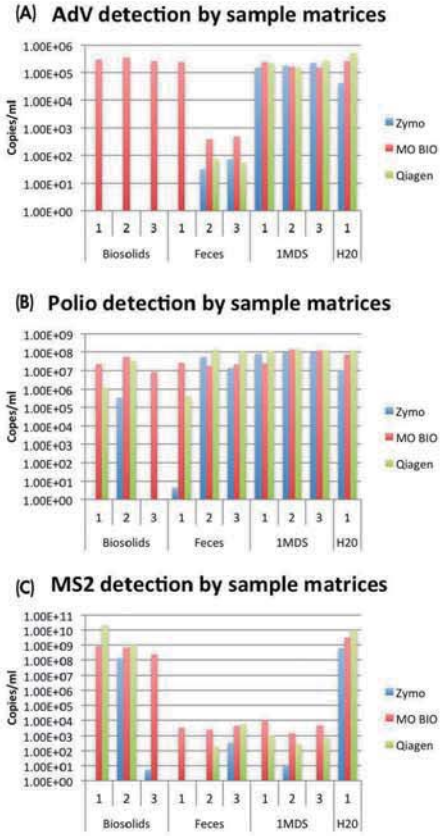


Figure 2. Higher yields of viral nucleic acids isolated using the PowerViral™ Environmental RNA/DNA Isolation Kit. Observed detection (log10 copies/ml determined by qPCR) of A) adenovirus 2 (AdV); B) poliovirus type 1 (PV1); and C) Bacteriophage MS2 (MS2) extracted using MO BIO, Zymo, or Qiagen kits from spiked molecular grade water (extraction efficiency controls), biosolid extracts, fecal suspensions, and 1MDS surface water concentrates. Three samples (1, 2, and 3 on the horizontal axis) for each type of environmental sample matrix were spiked with each virus. To adjust for the difference between the three extraction kits in their loading and elution volumes, the concentrations of the original spiked viruses were calculated from the qPCR data and expressed as log10 copies/ml. Only PowerViral™ Environmental RNA/DNA Isolation Kit detected viral nucleic acids from every sample type.
Data courtesy of B. Iker, University of Arizona, Tucson, AZ.

Specifications

Format	Silica Spin Filter Tubes
Method	Bead Beating (optional)
Binding Capacity	Up to 20 µg per filter
Throughput	1 - 24 samples
Time	30 minutes
Starting Amount	0.25 g of solid material or 200 µl of liquid
Equipment Required	Vortex and Vortex Adapter (if using bead beating) Centrifuge

Order information

Catalog No.	Description	Quantity
28000-50	PowerViral™ Environmental RNA/DNA Isolation Kit	50 preps
28000-BUNDLE	PowerViral™ Environmental RNA/DNA Isolation Kit + Bead tubes	50 preps

PowerMicrobiome™
RNA Isolation Kit

RNA

Get Your Research Moving

- ✓ **Optimized for samples high in PCR inhibitors** - Isolate total RNA from stool, gut material, dried feces, contaminated buccal swabs and secretions
- ✓ **Inhibitor Removal Technology®** - Eliminates 100% of inhibitory substances, resulting in RNA that is ready to use in RT-qPCR and next generation sequencing
- ✓ **Rapid protocol** - Enables isolation of high quality RNA in less than 45 minutes

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网址：www.anbiosci.com 邮箱：anbiosci@126.com 电话：0755-83489872 QQ：1362545403

PowerMicrobiome™ RNA Isolation Kit

MO BIO Laboratories

Get Your Research Moving

Description

The PowerMicrobiome™ RNA Isolation Kit is designed for fast and easy purification of total RNA from samples high in PCR inhibitors; including stool, gut material, dried feces, contaminated buccal swabs, and secretions. Patented Inhibitor Removal Technology® (IRT) ensures complete removal of inhibitory substances from digested food, heme from lysed red blood cells abundant in stool, and other PCR inhibitors. Isolated RNA is high quality and ready to use in the most demanding downstream applications, including RT-qPCR and sequencing. Optional removal of co-isolated DNA can be performed using a simple, on-column procedure with reagents provided in the kit. The PowerMicrobiome™ RNA isolation Kit is the only kit available that is optimized for stool and gut material and provides high quality RNA for use in characterizing the human microbiome.

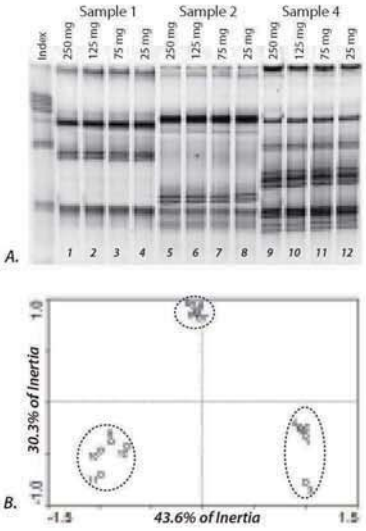

Fig 1. Use of RNA purified with the PowerMicrobiome™ RNA Isolation Kit for denaturing gradient gel electrophoresis (DGGE). Human neonatal stool samples were collected from three individuals, and RNA was isolated from 25-250 mg of each sample using the PowerMicrobiome™ RNA Isolation Kit. An RNA-DGGE profile was produced from the various weights of stool (A). High quality RNA was isolated, enabling a correspondence analysis to be carried out on normalized data from the DGGE profile (B). The correspondence analysis revealed clustering based on sample rather than weight (dotted rings), indicating that high quality RNA can be isolated even from low amounts of stool. Data courtesy of C. Stewart, University of Northumbria, Newcastle upon Tyne, UK.

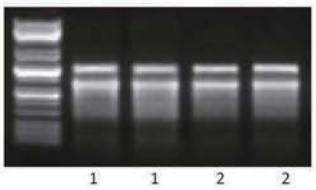

Fig 2. Isolation of high quality total RNA from stool samples using the PowerMicrobiome™ RNA Isolation Kit. Fresh canine stool samples were collected in an experimental RNA preservation solution and transported to the lab at room temperature (sample 1) or on ice (sample 2).

Sample collection and processing were performed on the same day. Total RNA was isolated using the PowerMicrobiome™ RNA Isolation kit and 10 µl of each sample was examined on a 1% agarose gel.

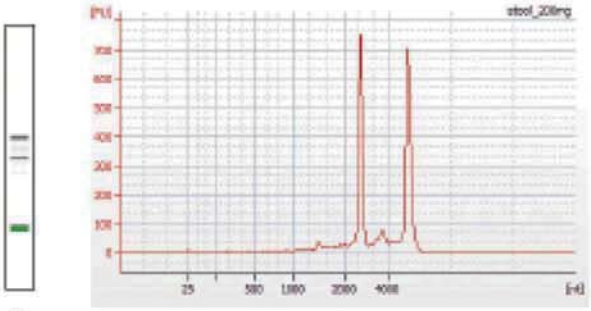

Fig 3. Isolation of high quality, intact total RNA from human stool using the PowerMicrobiome™ RNA Isolation Kit. Samples were collected from a healthy volunteer and total RNA was purified using the PowerMicrobiome™ RNA Isolation Kit. An Agilent BioAnalyzer RNA Nano kit chip was used to profile and quantify 1 µl of RNA. Clear 16S and 23S bands for prokaryotic rRNA were observed in the electrophoresis image (A) and are shown in detail in the electropherogram (B). High quality RNA was observed, as demonstrated by a RIN of 9.4. Data courtesy of C. Vincent, McGill University and Genome Québec Innovation Centre, Montréal (Québec) Canada.

Specifications

Format	Silica Spin Filter Tubes
Method	Bead Beating
Starting Amount	0.25 g
Binding Capacity	Up to 40 µg per filter
Throughput	1 - 24 samples
Time	45 minutes
Equipment Req'd	Vortex and Vortex Adapter Centrifuge

NEW

PowerMag™ Microbiome RNA /DNA Isolation Kit

- ✓ Automated, hands-free purification
- ✓ Optimized lysis for tough samples
- ✓ Inhibitor Removal Technology®
- ✓ ClearMag™ Technology

The PowerMag™ Microbiome RNA/DNA Isolation Kit is designed for automated isolation of nucleic acids from stool, biosolids and gut material. The protocol includes patented Inhibitor Removal Technology® and Novel ClearMag™ magnetic particle technology. The PowerMag™ Microbiome RNA/DNA Isolation Kit has been optimized for use with the Eppendorf epMotion® and theThermo Scientific KingFisher® Flex and KingFisher® Duo automated processing systems.

Order information

Catalog No.	Description	Quantity
26000-50	PowerMicrobiome™ RNA Isolation Kit	50 preps
27500-4-EP	PowerMag™ Microbiome RNA/DNA Isolation Optimized for epMotion®	4 x 96 preps
27500-4-KF	PowerMag™ Microbiome RNA/DNA Isolation Optimized for KingFisher®	4 x 96 preps

深圳市安必胜科技有限公司

DNA & RNA Isolation from water samples

Inhibitor-free DNA from Challenging Water Samples

DNA & RNA

✓ **PowerWater® DNA Isolation Kit**
With patented Inhibitor Removal Technology® to obtain pure DNA from even the most turbid and contaminated water samples

✓ **PowerWater® RNA Isolation Kit**
To isolate high quality total RNA from a variety of filtered water samples, including turbid waters

✓ **PowerWater® Sterivex™ DNA Isolation Kit**
For the isolation of high quality genomic DNA from a variety of water samples directly from Sterivex™ Filter Units

Also available:

✓ **RapidWater® DNA Isolation Kit**
Fast isolation of DNA from clean, non-turbid water

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Inhibitor-free DNA or RNA Isolation from Challenging Water Samples

Introduction

A streamlined method for DNA purification from water samples for microbial detection and quantification is highly desirable for both research and water quality testing. A number of methods are used, but the fastest methods involve the binding of nucleic acids to silica spin columns. The efficiency of purifying DNA using silica spin columns is not always balanced with the goal of obtaining high-quality DNA from complex samples. In many cases, inhibitors are not removed, negatively affecting downstream applications. The MO BIO Laboratories PowerWater® DNA Isolation Kit was developed to isolate high-quality, inhibitor-free DNA from diverse water samples.

Compatible with a wide range of filters

A number of filter membrane types are used for water research and testing which differ in composition, pore size, and capacity. As a result, lysis efficiency can vary. Cell lysis was optimized for the most commonly used filter membrane types (Figure 1). Optimization included a more robust lysis buffer and use of larger bead tubes containing a novel garnet bead mix. All of these modifications yielded a faster protocol by minimizing vortex time.

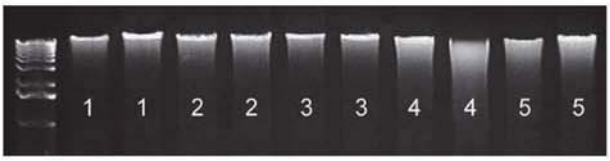

Figure 1. DNA results from bacteria (2 mL of an overnight *Escherichia coli* culture) spiked water samples. Samples were vacuum filtered, in duplicate, through five different membrane types (1 = polyethersulfone, 2 =cellulose acetate, 3 = cellulose nitrate, 4 = polycarbonate, 5 = aluminum oxide) and the DNA isolated using the PowerWater® DNA Isolation Kit. Total yields were highly comparable, averaging 5.3 µg ± 0.77µg.

Inhibitor Removal Technology® for removal of contaminants

Sample inhibition in the form of suspended solids and dissolved compounds can influence target DNA isolation and detection. Patented Inhibitor Removal Technology® (IRT), for the removal of PCR inhibitors, is a key component in the PowerWater® protocol allowing for better amplification of target DNA. (Figure 2).

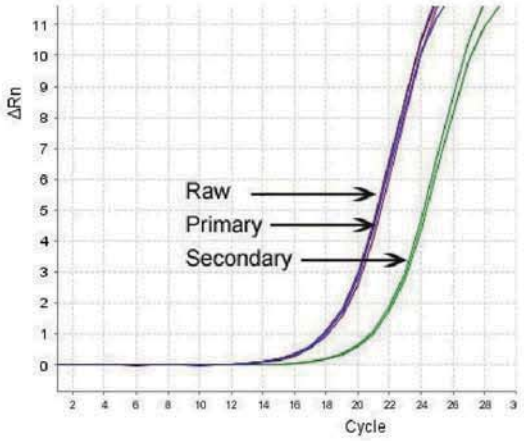

Figure 2. Real-time PCR results for raw, primary-treated, and secondary-treated sewage. Samples (50 mL each) were vacuum filtered, in duplicate, through 0.45 µm cellulose acetate filter membranes. DNA was isolated using the PowerWater® DNA Isolation Kit and total microbial DNA was detected with a SYBR green assay using universal 16S rDNA primers. Purified *E. coli* DNA was used as the standard with an assay efficiency of 90.8%. As expected, raw and primary treated sewage had significantly higher levels of bacteria compared to secondary treated sewage, as indicated by the lower Ct values.

Conclusion

The PowerWater® DNA Isolation Kit and The PowerWater® RNA Isolation Kit have been optimized for maximum yield, purity, and inhibitor removal. These kits can be utilized with a variety of water samples (marine, brackish, fresh, sewage) using common filter membrane types. The easy-to-use protocol can isolate pure DNA or RNA from water samples in less than 25 min.

For further information, visit our website at www.mobio.com.

Order information

Catalog No.	Description	Quantity
14900-50-NF	PowerWater® DNA Isolation Kit	50 preps
14900-100-NF	PowerWater® DNA Isolation Kit	100 preps
14700-50-NF	PowerWater® RNA Isolation Kit	50 preps
14600-50-NF	PowerWater® Sterivex™ DNA Isolation Kit	50 preps
14810-50-NF	RapidWater® DNA Isolation Kit	50 preps

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Fax: 0755-8348 9700
email: anbiosci@126.com

PowerWater® Sterivex™ DNA Isolation Kit

DNA

The missing link in DNA isolation from water

- ✓ **Fast -** 40 minute protocol from start to finish
- ✓ **In-unit digestion -** No need to struggle with removing filters from Sterivex™ units
- ✓ **No harsh chemicals -** Column-based purification protocol eliminates the need for phenol/chloroform extraction
- ✓ **Cell Release Solution -** Improves release of cells from the membrane which increases DNA yield

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电话：0755-83489872 传真：0755-83489700 QQ：1362545403、854520654

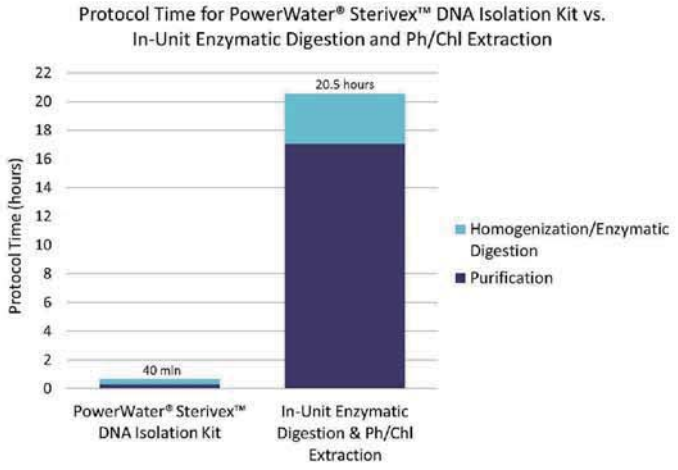
PowerWater® Sterivex™ DNA Isolation Kit

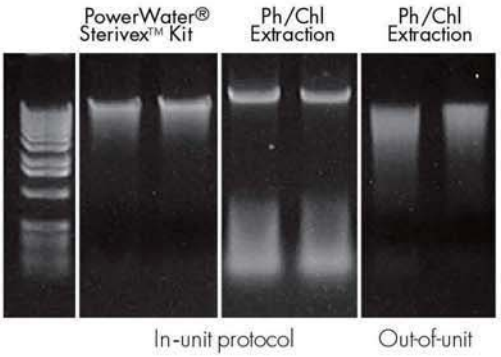
MO BIO Laboratories

The missing link in DNA isolation from water

The PowerWater® Sterivex™ DNA Isolation Kit is the only kit available to isolate genomic DNA from Sterivex™ filter units (Millipore) without the need for enzymes or hazardous organic chemicals. Utilizing a novel Cell Release Solution, microbes are released from the Sterivex™ filter units without extensive incubation times or cutting open the plastic casing holding the membrane, enabling purification of high quality DNA in just 40 minutes. Patented Inhibitor Removal Technology® (IRT) is included to provide high quality DNA from all types of water samples, even those containing heavy amounts of contaminants. In addition, a unique silica binding column and column extender enable one-step addition of a large volume of solution (4.5 ml) and elution in a 50-100 µl volume.

The PowerWater® Sterivex™ DNA Isolation Kit protocol starts with the addition and incubation of the Sterivex™ units with Cell Release Solution. Lysis buffer is then added to the units, followed by mixing and removal of the lysate for homogenization in a 5 ml bead beating tube. After the protein and inhibitor removal steps, total genomic DNA is captured on a silica binding column using a vacuum manifold. High quality DNA is then washed and eluted from the binding column membrane for use in downstream applications including PCR and qPCR. This kit is recommended for use with Millipore catalog #SVGPL10RC Sterivex™ GP Filter units, but is also compatible with other Sterivex™ Filter units.





DNA isolated using the PowerWater® Sterivex™ DNA Isolation Kit exhibited a higher yield of high molecular weight dsDNA with little to no shearing and less RNA carryover compared with other common methods. The in unit method not using the PowerWater® Sterivex™ protocol used enzymatic lysis followed by phenol chloroform. The out-of-unit method required removal of filter from the Sterivex™ unit then used a phenol bead beating protocol.

Specifications

Format	Silica Binding Column
Method	Bead Beating
Binding Capacity	Up to 20 µg per filter
Purity	A260/280: 1.7 - 2.0 A260/230: >1.5
Time	40 minutes
Equipment Required	Vortex, Centrifuge, and PowerVac™ Manifold Mini System

Related Product: PowerVac™ Manifold

The PowerWater® Sterivex™ DNA Isolation Kit should be used with a PowerVac™. The PowerVac™ can process up to 20 samples simultaneously, reduces waste handling, and can also be used to speed up MO BIO's spin column-based protocols by eliminating the need for centrifugation.

Order information

Catalog No.	Description	Quantity
14600-50-NF	PowerWater® Sterivex™ DNA Isolation Kit	50 preps
11991	PowerVac™ Manifold	1 manifold

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Tel: 0755-8348 9872

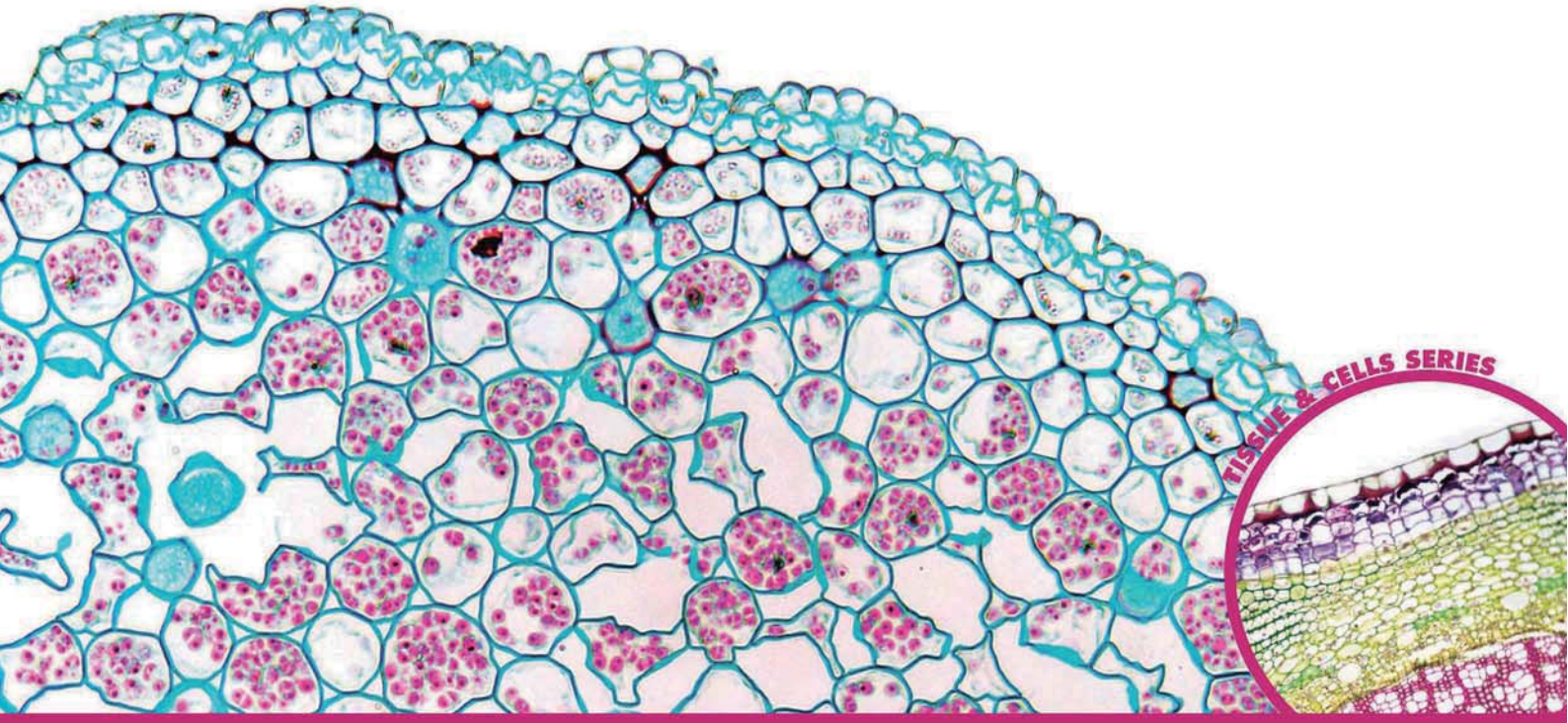
MO BIO Laboratories, Inc.

UltraClean® Tissue & Cells
DNA & RNA Isolation

DNA/RNA

High Quality, Every Time, Whatever the Source

- ✓ **Rapid protocol**
  Isolate high quality, pure nucleic acids in just 20 minutes
- ✓ **Optimized cell lysis using bead beating technology**
  Saves time and increases nucleic acid yield
- ✓ **Safe procedure**
  Avoids the use of hazardous organic solvents



UltraClean® Tissue & Cells DNA & RNA

MO BIO Laboratories

High Quality, Every Time, Whatever the Source

UltraClean® Tissue & Cells DNA Isolation Kit

The UltraClean® Tissue & Cells DNA Isolation Kit is ideal for isolating genomic DNA from cultured cells or animal tissues, including rodent tails. DNA is high quality and ready for PCR, restriction digests, and other downstream applications. The UltraClean® Tissue & Cells DNA Isolation Kit is safe and user-friendly, avoiding the use of organic solvents like phenol and chloroform.

The UltraClean® Tissue & Cells DNA Isolation Kit is designed for isolating DNA from 1-25 mg tissue samples or up to 5 x 10^6 cells.

Fresh or frozen tissue samples are homogenized using bead beating technology to lyse the cells. Lysates are loaded onto a silica spin filter. DNA binds to the silica spin filter while contaminants pass through. Remaining contaminants and enzyme inhibitors are removed by a wash step. Pure DNA is then eluted into certified, DNA-free Tris buffer. This kit requires a microcentrifuge, vortex and our Vortex Adapter.

This kit contains an optional step for tough tissue samples such as bone, hair and mouse tails. Lyophilized Proteinase K is included for the processing of tough tissue samples.

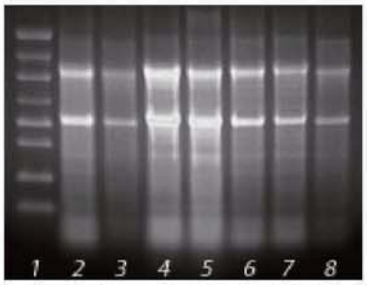
1,2 = Brain
3,4 = Heart
5,6 = Kidney
7,8 = Liver
9,10 = Spleen
11 = MO BIO 1kb DNA ladder*

Genomic DNA isolated from mouse tissues using the UltraClean® Tissue & Cells DNA Isolation Kit was digested with EcoR I and displayed on a 1.2% TAE agarose gel. Lanes 1,3,5,7,9: undigested DNA. Lanes: 2,4,6,8,10: Digested DNA. *Lane 11: MO BIO 1 kb DNA ladder (Catalog #17200-100)

UltraClean® Tissue & Cells RNA Isolation Kit & PowerLyzer™ UltraClean® Tissue & Cells RNA Isolation Kit

The UltraClean® Tissue RNA Isolation Kit & PowerLyzer™ UltraClean® Tissue RNA Isolation Kit are designed to provide efficient purification of total RNA from a variety of mammalian tissues or cultured cells.

Prepared fresh or frozen tissues are homogenized using a homogenizer such as the PowerLyzer™, or mortar and pestle in the presence of lysis solutions. The RNA is then bound to a silica spin filter, washed and eluted into certified RNase-free water (provided). The kits include all RNase-free reagents ready to use and all required spin filters and tubes. RNA is of high quality and is ready to use in any downstream application including RT-PCR.



1 = Marker
2 = Brain
3 = Heart
4 = Lung
5 = Liver
6 = Kidney
7 = Tail
8 = Thymus

Total RNA from various tissues isolated with the UltraClean® Tissue RNA Isolation Kit and displayed on a denaturing formaldehyde agarose gel.

Specifications	UltraClean® Tissue & Cells DNA Isolation Kit	UltraClean® Tissue & Cells RNA Isolation Kit	PowerLyzer™ UltraClean® Tissue & Cells RNA Isolation Kit
Format	Silica Spin Filter Tubes	Silica Spin Filter Tubes	Silica Spin Filter Tubes
Method	Bead Beating	Manual homogenization	Homogenizer
Starting Amount	1 - 25 mg	1 - 25 mg	1 - 25 mg
Binding Capacity	Up to 40 µg per filter	Up to 40 µg per filter	Up to 40 µg per filter
Throughput	1 - 24 samples	1 - 24 samples	1 - 24 samples
Time	20 minutes	35 minutes	35 minutes
Equipment Required Recomended	Microcentrifuge, Vortex & Vortex Adapter	Microcentrifuge, Vortex	Microcentrifuge, Vortex / Tissue Homogenizer

Catalog No.	Description	Quantity
12334-50 12334-250	UltraClean® Tissue & Cells DNA Isolation Kit	50 or 250 preps
15000-50 15000-250	UltraClean® Tissue & Cells RNA Isolation Kit	50 or 250 preps
15055-50	PowerLyzer™ UltraClean® Tissue & Cells RNA Isolation Kit	50 preps

联系订购

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BiOstic® FFPE Tissue DNA and RNA Isolation Kits

Giving You Access To Invaluable Information

DNA/RNA

- ✓ **No xylene or other toxic solvents –** Fast and safe paraffin removal method.
- ✓ **Higher yields and concentration –** New and unique low elution spin filter enables high recovery efficiency in a volume of just 20 µl
- ✓ **Successful amplification –** Contaminant-free nucleic acids enable more sensitive results in RT-qPCR, microarrays and sequencing

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BiOstic® FFPE Tissue DNA Isolation Kit

The BiOstic® FFPE Tissue DNA Isolation Kit uses a non-toxic method designed to extract and purify genomic DNA from formalin-fixed, paraffin-embedded tissues.

The BiOstic® FFPE Tissue DNA Isolation Kit uses a novel method to directly isolate DNA from tissue without the use of solvents such as xylene to deparaffinize the tissue. A proprietary buffer formulation results in complete dissolution of the wax to release the tissue. A 90°C heating step removes protein-DNA cross-links that are inhibitory to PCR. Higher DNA yield is achieved as a result of this method. The recovered DNA is high molecular weight and free from contaminants that can have an adverse effect on detection sensitivity and amplification efficiency. Genomic DNA extracted with the BiOstic® FFPE Tissue DNA Isolation Kit can be used in real time PCR, SNP genotyping, and other genetic analysis methods.

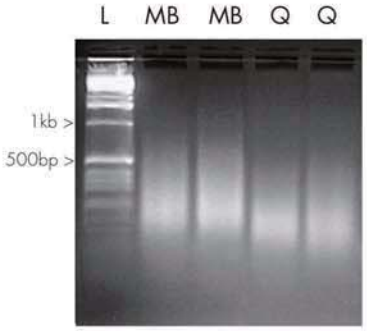
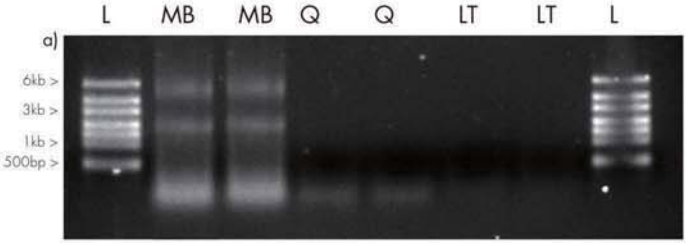


Fig 1. Higher molecular weight. The fixation process and storage of FFPE samples frequently leads to nucleic acid degradation and base modification. DNA prepared with the BiOstic® FFPE Tissue DNA Isolation Kit (MB) shows higher molecular weight distribution when compared to the competitor's xylene protocol (Q).

Specifications	DNA	RNA
Binding Capacity (per spin	Up to 40 µg	Up to 50 µg
Time:		
Melting /cross-link remova	1 hr / 1hr	15 min/15min
Centrifugation steps	20 min	20 min
Format	Silica Spin Filter Tubes	
Method	Direct melting of FFPE tissues	
Sample Size	1 to 5 single slices or 15 mg of tissue	
Throughput	1 - 24 samples	
Equipment Required	Vortex, centrifuge, and water baths or heat blocks	

BiOstic® FFPE Tissue RNA Isolation Kit

The BiOstic® FFPE Tissue RNA Isolation Kit is optimized for complete lysis and extraction of total RNA from formalin-fixed, paraffin-embedded tissues without the use of organic solvents. A proprietary buffer formulation in conjunction with a Proteinase K lysis facilitates complete dissolution of the wax during a 60°C heating step to release the tissue. A second 70°C heating step removes the cross-links that are inhibitory to RT-qPCR. Genomic DNA is removed in an on-column DNase digestion step utilizing our room temperature stable (RTS) DNase. RNA from the melted sample is purified on our unique low elution silica spin filters to increase the final RNA concentration. RNA from the BiOstic® FFPE Tissue RNA Isolation Kit is ready to use in any downstream application including RT-qPCR, microarrays and sequencing.



b)

Sample	MB	MB	Q	Q	LT	LT
ng/µl	38.4	35.5	8.89	9.96	8.23	7.84

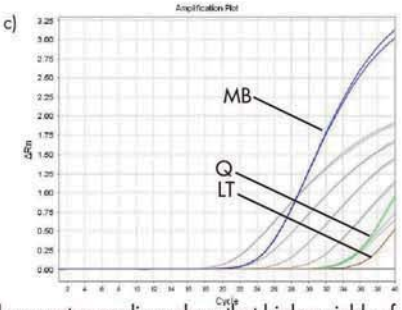


Fig 2. Higher yields of intact RNA. Comparative analysis of the BiOstic® FFPE Tissue RNA Isolation Kit (MB) and competitors Q and LT of RNA extraction from a single 10 micron tissue slice of FFPE Normal Human Liver tissue. a) 1.2% TAE gel showing higher yields of intact RNA obtained when sample was prepared with the BiOstic® FFPE Tissue RNA Isolation Kit. b) Invitrogen Qubit™ Fluorometer readings show that higher yields of RNA were obtained when sample was prepared with the BiOstic® FFPE Tissue RNA Isolation Kit (MB). (c) RT-qPCR using a TaqMan® ActB assay shows succesful amplification from undiluted samples prepared with the MO BIO BiOstic® FFPE Tissue RNA Isolation Kit (Blue). Samples prepared with competitors' kits (Q in green and LT in brown) failed to amplify.

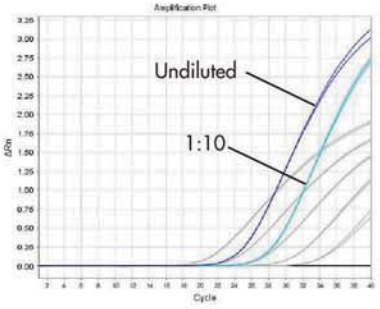


Fig 3. Successful RT-qPCR amplification. (a) RNA isolated with the BiOstic FFPE Tissue RNA kit was analyzed by RT-qPCR as above. Undiluted RNA (Dark Blue) and a 1:10 dilution of the same RNA (Light Blue) amplified with approximately 3 cycles between them. This is indicative of the absence of inhibitors, such as persistent cross-links, that would otherwise decrease amplification efficiency.

Order information

Catalog No.	Description	Quantity
12250-50	BiOstic® FFPE Tissue DNA Isolation Kit	50 preps
13250-50	BiOstic® FFPE Tissue RNA Isolation Kit	50 preps

The BiOstic® FFPE DNA Isolation Kit and The BiOstic® FFPE RNA Isolation Kit are sold for research purposes only.

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email: anbiosci@126.com

DNA

UltraClean®-htp 96 Well Swab DNA Kit

MO BIO Laboratories, Inc.

Release unbiased DNA in minutes

- ✓ **Rapid protocol** – Release microbial DNA from swabs in just 10 minutes
- ✓ **Bead based homogenization** – Increases DNA release in low biomass samples
- ✓ **Ready to use** – Samples can be applied directly to PCR for metagenomic analysis

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UltraClean®-htp 96 Well Swab DNA Kit

MO BIO Laboratories

Release unbiased DNA in minutes

The UltraClean®-htp 96 Well Swab DNA Kit is designed for mechanical lysis of microbial cells from low biomass and low inhibitor containing swabs, paper or filter paper for direct application to PCR for metagenomic analysis. This is not a DNA isolation kit. Samples are added to a 96 well bead plate for rapid and thorough homogenization. Cell lysis occurs by a combination of mechanical and chemical methods. The DNA is ready for PCR in just 10 minutes.

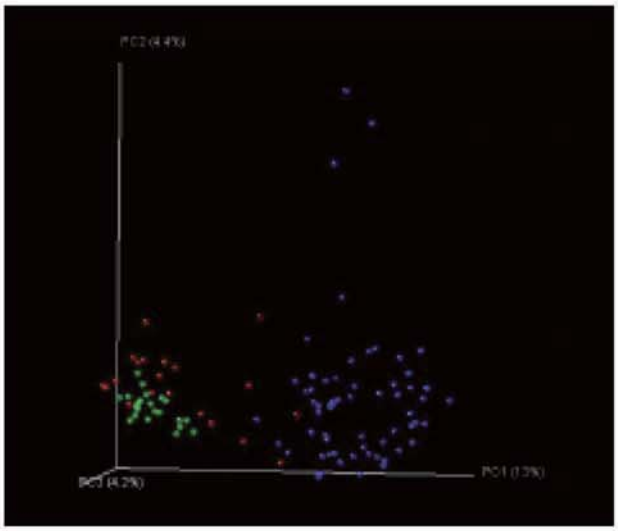

Figure 1. PCoA plot displaying the distribution of samples color coded by cleaning regimen. DNA was released from swabs collected from gym equipment using the UltraClean®-htp 96 Well Swab DNA Kit. Each dot represents a different sample, and the three different colors represent three different types of cleaning regimens: spray cleaner (blue dots); cleaning wipes (red dots); and no regular cleaning (green dots). The grouping of the dots show qualitatively, that how the equipment is cleaned may influence the composition of the samples. Further investigation of the clustering trends shown in plots like these can determine if factors like cleaning play a significant role in microbial community structure.(*)

(*) Data courtesy of:
Mariah Wood[1,2], Jarrad Hampton-Marcell[1], and Jack Gilbert[1].
Argonne National Laboratory[1], Argonne, IL and
Weinberg College of Arts and Sciences[2], Northwestern University, Evanston, IL.

Specifications

Method	Bead Beating
Starting sample	Single swab, piece of paper or filter paper small enough to submerge in a 500 µl volume.
Throughput	96 samples
Time	10 minutes
Equipment Required	96 Well Plate Shaker

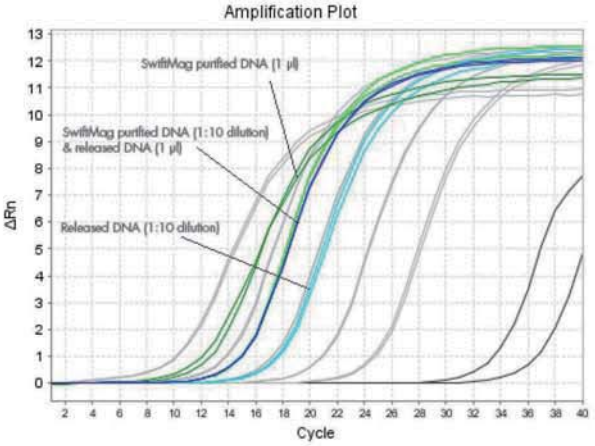

Figure 2. DNA purified with the UltraClean®-htp 96 Well Swab DNA Kit is ready to use in qPCR. Pellets of overnight *E. coli* culture were collected on sterile polyester swabs which were then processed in the UltraClean®-htp 96 Well Swab DNA Kit to release DNA in a final volume of 500 µl. 1 µl and a 1:10 dilution of solution containing released DNA was used directly for 16S qPCR with Bact/Pro primers, while the remaining solution was purified on a Thermo Scientific KingFisher® Duo using MO BIO's SwiftMag® Magnetic Bead Technology. Following purification, DNA was eluted into a final volume of 50 µl, a 10 fold concentration over the initial released DNA. 1 µl and a 1:10 dilution of this solution was used for 16S qPCR with Bact/Pro primers. Cq values of the initial 1 µl of released DNA correlated with the 1:10 dilution of the purified DNA, indicating that no DNA was lost between the release and purification. Additionally, the results show that, for samples without inhibitors, DNA released using the UltraClean®-htp 96 Well Swab DNA Kit is pure enough for qPCR.

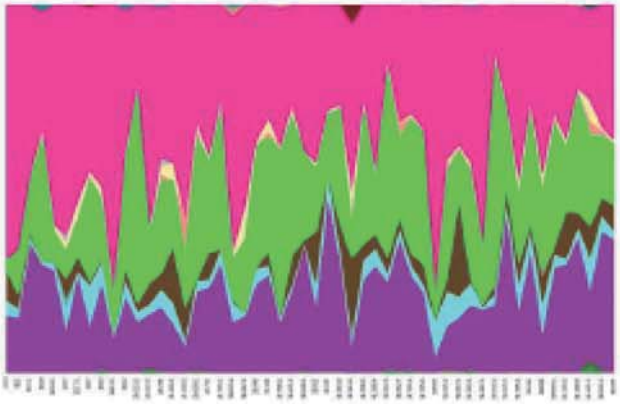

Figure 3. Taxa summary demonstrating which microbes are present at a given time. DNA was released from swab samples of hand weights in the gym using the UltraClean®-htp 96 Well Swab DNA Kit. A specific sample was tracked over the course of three days at the phylum level. Phylums examanined include Actinobacteria (purple), Bacteroidetes (blue), Cyanobacteria (brown), Firmicutes (green), Proteobacteria (pink) and "Other" bacteria (yellow).(*)

Order information

Catalog No.	Description	Units
29000-4	UltraClean®-htp 96 Well Swab DNA Kit	4 x 96 Preps

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邮箱：anbiosci@126.com
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QQ：1362545403

DNA & RNA

DNA & RNA Isolation from blood samples

MO BIO Laboratories, Inc.

- ✓ **UltraClean® BloodSpin® DNA Isolation Kit**
  Designed to isolate genomic and mitochondrial DNA from whole blood, buffy coat or cultured cells
- ✓ **UltraClean® Blood DNA Isolation Kit (No Spin Filter)**
  Solution-based gentle procedure to eliminate shearing for Isolation of DNA from whole blood
- ✓ **BiOstic® Bacteremia DNA Isolation Kit**
  Efficient purification of bacterial DNA from cultured blood, fecal or cervical swabs
- ✓ **BiOstic® Blood Total RNA Isolation Kit**
  Isolate total RNA from whole blood, buffy coat or bone marrow.

UltraClean® BloodSpin® DNA Isolation Kit

The UltraClean® BloodSpin® DNA Isolation Kit is designed to isolate genomic and mitochondrial DNA from whole blood (fresh, frozen or stored at 4°C), buffy coat or cultured cells.

In the presence of Proteinase K, cells are lysed, and proteins are degraded. The lysate is centrifuged through a silica membrane spin filter. DNA is bound to the spin filter due to the high salt nature of the lysis buffer. The filter is washed. Finally, the DNA is recovered in certified DNA-free Tris buffer.

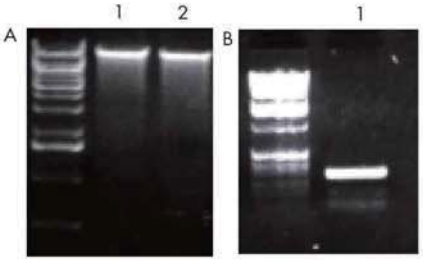


Fig1. Genomic DNA was isolated from whole blood using the UltraClean® Bloodspin® Kit and displayed on 1.2% TAE agarose gel (A). PCR amplification was performed on isolated DNA using primers for human betaglobin (B).
A1, A2: Undigested DNA
B1: PCR reaction

12200-50	UltraClean® BloodSpin® DNA Isolation Kit	50 preps
12296-4 (*)	UltraClean® -htp 96 Well BloodSpin® DNA Isolation Kit	4 x 96 preps

(*) Custom order

BiOstic® Bacteremia DNA Isolation Kit

The BiOstic® Bacteremia DNA Isolation Kit enables efficient purification of bacterial DNA from cultured blood, fecal or cervical swabs while completely removing PCR inhibitors common in blood, swabs and culture medium.

Bacterial genotyping from cultured blood can be difficult due to the presence of PCR inhibitors such as charcoal used for the removal of antibiotics from patient blood (e.g. BacT/ALERT™ SA tubes).

The BiOstic® Bacteremia DNA Isolation Kit utilizes our novel, patented Inhibitor Removal Technology® (IRT) combined with mechanical bead beating lysis to isolate pure genomic DNA that is free of inhibitory substances and ready to use in bacterial genotyping assays such as the Bacterial Barcodes Rep-PCR assays and other multiplex PCR or real-time PCR assays.

The BiOstic® Bacteremia DNA Isolation Kit has been successfully tested on Gram - and Gram + bacteria.

12240-50	BiOstic® Bacteremia DNA Isolation Kit	50 preps

UltraClean® Blood DNA Isolation Kit (No Spin Filter)

The UltraClean® Blood DNA Isolation Kit (Non-Spin) is designed to isolate very high molecular weight genomic DNA from whole blood, buffy coat or cultured cells. It is a solution-based kit that employs a gentle procedure to eliminate shearing (No spin filter used).

This UltraClean® Blood DNA Isolation Kit provides all the reagents and protocols for isolating high quality genomic, mitochondrial or viral (if associated with white blood cells) DNA from 300µl, 3 ml and up to 10ml of mammalian whole blood, buffy coat, bone marrow cells, cultured cells and buccal swabs.

Fig2. Genomic DNA was isolated from whole blood using the UltraClean® Blood DNA Isolation Kit (Non Spin) and displayed on 1.2% TAE agarose gel.
1- Undigested DNA

12000-100	UltraClean® Blood DNA Isolation Kit (Non-Spin)	100 preps
12000-1000	UltraClean® Blood DNA Isolation Kit (1,000 ml)	Up to1,000ml of blood
12002-1000	UltraClean® Blood DNA Isolation Kit (1,000 ml)/+RNase	Up to1,000ml of blood

BiOstic® Blood Total RNA Isolation Kit

The BiOstic® Blood Total RNA Isolation Kit provides a way to purify RNA from up to 2 ml of whole blood or 10 million cells using a fast and easy spin column. This method uses a simple hypotonic red blood cell (RBC) lysis to obtain a white blood cell (WBC) pellet for extraction of RNA. Silica Spin column products utilize the novel MO BIO flat bottom spin column design, which provides improved sample processing and yields. The bucket configuration of the spin filter allows for enhanced sample flow and membrane drying after wash step since the entire membrane is accessible for air flow.

The silica technology provides a robust and fast way to purify nucleic acids without the use of organic solvents or cesium chloride gradients.

Supplier	Avg. Yield*	Avg. 260/280
MO BIO	25µg	2.0
Competitor Q	1.2µg	1.9
Competitor I	1.6µg	1.6

*Per 500µl blood

12230-50	BiOstic® Blood Total RNA Isolation Kit	50 preps

MO BIO Laboratories, Inc.

UltraClean® Mini Plasmid Prep Kits

Not Just Another Plasmid Kit

DNA

- ✓ **High Quality DNA** – Isolate plasmids ready for downstream assays such as sequencing, restriction digests or PCR
- ✓ **Rapid Protocol** – Purify high-quality, supercoiled plasmid DNA
- ✓ **Robust Yields** – Match or exceed the competition in total yield, with less RNA carryover
- ✓ **Complete Kit** – Includes all the required reagents and tubes, ready to use

UltraClean® Mini Plasmid Prep Kits

Not Just Another Plasmid Kit

UltraClean® 6 Minute Mini Plasmid Prep Kit

- ✓Suitable for up to 2ml of culture
- ✓Purify high-quality, supercoiled plasmid DNA in 6 minutes
- ✓Compatible with high nutrient media. Ideal for low copy plasmids

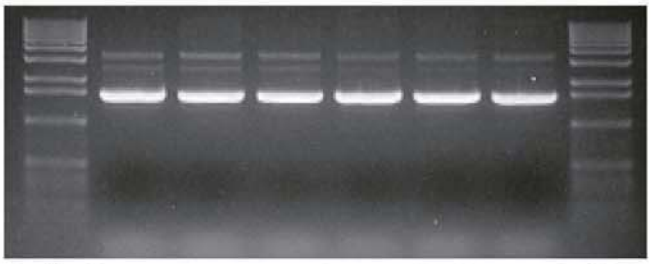
UltraClean® Standard Mini Plasmid Prep Kit

- ✓ Suitable for up to 5ml of culture
- ✓ Purify high-quality, supercoiled plasmid DNA in 10 minutes

UltraClean®-htp 96 Well Plasmid Prep Kit

- ✓ Process 96 plasmid mini prep samples in 45 minutes
- ✓ Compatible with most automated systems

6 Minute Gel



[1kb][Q][MO BIO][1kb]

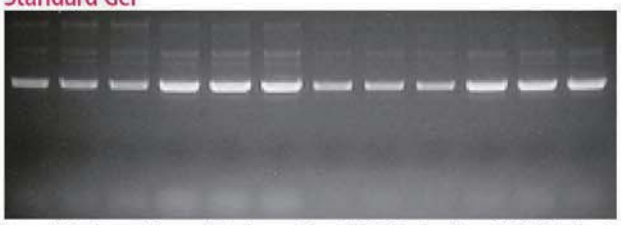
Plasmids were isolated from 2ml of LB overnight cultures using either MO BIO Laboratories' UltraClean® 6 Minute Mini Plasmid Prep Kit or a kit from competitor Q. Yield and quality were not significantly different.

Specifications

	6 Minute Mini	Standard Mini	96 Well
Format	Silica Spin Filter Tubes	Silica Spin Filter Tubes	Silica Spin Plate
Method	Alkaline Lysis	Alkaline Lysis	Alkaline Lysis
Binding Capacity	Up to 20 µg per filter	Up to 20 µg per filter	Up to 20 µg per well
Throughput	1 - 24 samples	1 - 24 samples	96 samples
Time	6 minutes	10 minutes	45 minutes
Equipment Req'd	Microcentrifuge	Microcentrifuge	Plate centrifuge**

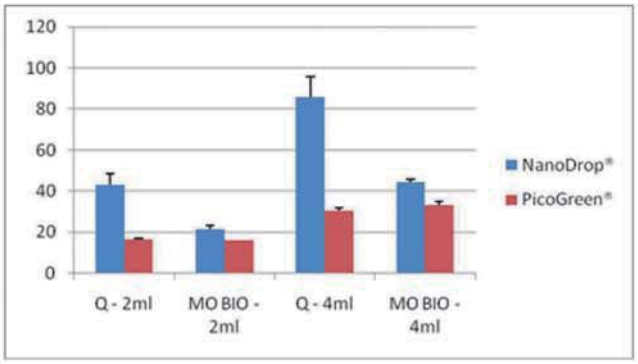
**vacuum manifold optional

Standard Gel



[Q 2ml][Q 4ml][MO BIO 2ml][MO BIO 4ml]

Less RNA carryover with MO BIO kits is demonstrated by the correlation between NanoDrop and PicoGreen data



Plasmids were isolated from 2ml or 4ml* of LB overnight cultures using either MO BIO Laboratories' UltraClean® Standard Mini Plasmid Prep Kit or a kit from competitor Q. Yield and quality as measured by gel electrophoresis and PicoGreen quantitation were not significantly different. Yields from competitor Q appear higher on the NanoDrop spectrophotometer. However, NanoDrop measures the presence of all nucleic acids which suggests that the plasmids isolated from competitor Q contains residual RNA. PicoGreen preferentially binds double-stranded DNA and in this case is a more accurate measure of yield than NanoDrop.

*5ml data not shown

Order Information

Catalog No.	Description	Quantity
12300-50	UltraClean® 6 Minute Mini Plasmid Prep Kit	50 preps
12300-100	UltraClean® 6 Minute Mini Plasmid Prep Kit	100 preps
12300-250	UltraClean® 6 Minute Mini Plasmid Prep Kit	250 preps
12301-50	UltraClean® Standard Mini Plasmid Prep Kit	50 preps
12301-100	UltraClean® Standard Mini Plasmid Prep Kit	100 preps
12301-250	UltraClean® Standard Mini Plasmid Prep Kit	250 preps
12396-4	UltraClean®-htp 96 Well Plasmid Prep Kit	4 x 96 preps
12396-12	UltraClean®-htp 96 Well Plasmid Prep Kit	12 x 96 preps

ENZYMES

RTS DNase™ Kit

Don't lose your precious RNA

- ✓ **Room Temperature Stable DNase** - Eliminates freeze-thaws to maintain enzyme activity at the highest level
- ✓ **Protects RNA** - Certified RNase-free, no heat, EDTA or harsh chemicals
- ✓ **DNase Removal Resin** - Completely removes DNase and divalent cations for optimal qPCR results or other downstream applications
- ✓ **Fast** - 30 minute protocol from start to finish

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RTS DNase™ Kit

Don't lose your precious RNA

Description

RTS (Room Temperature Stable) DNase is a highly purified DNase I enzyme formulated in a unique stabilization solution that provides long term stability at room temperature. The RTS DNase™ Kit is used for the removal of genomic DNA contamination in RNA preparations. The RTS DNase™ Kit will remove up to 30 µg of DNA in 30 minutes total using 10 units (1 µl) of enzyme. The enzyme is stable for up to 6 months at room temperature with no loss of activity and for 2 years at 4°C without loss of activity. The RTS DNase™ Kit also contains a novel and highly specific resin which is used to bind and remove the RTS DNase enzyme and divalent cations from the reaction, eliminating the need for heat or EDTA inactivation of the DNase. The RNA is protected and ready to use immediately after resin treatment.

The RTS DNase™ Kit protocol starts with dilution of RTS DNase and 10X RTS DNase buffer to a final concentration of 1X in the digestion reaction. The reaction is then incubated at 37°C for 20 minutes. Removal of the DNase and divalent cations is performed by adding RTS DNase Removal Resin and incubating for 10 minutes at room temperature. The resin is pelleted by centrifugation, and the RNA sample is transferred to a new tube, ready for use in RT-PCR and further analysis.

Preserve Enzyme Activity

RTS DNase is the first DNase I enzyme which is stable at room temperature, so there is no need to aliquot and freeze stocks of the enzyme. Room temperature stability eliminates concern about freeze-thaw cycles that may decrease enzymatic activity. RTS DNase maintains full activity over the life of the kit, enabling consistent results with all RNA samples.

Protect your RNA

Isolating high quality RNA is a time-consuming and expensive process. Consequently, it is essential to prevent RNA degradation during DNase treatment. The RTS DNase™ kit contains only Certified RNase-free reagents, and does not require heat, EDTA or harsh chemicals, ensuring protection of valuable RNA samples.

Specifications

Unit Definition	10 units/µl 10 units removes up to 30 µg of DNA
Time	30 minutes
Stability	6 months at room temperature 2 years at 4°C
Equipment Req'd	Centrifuge

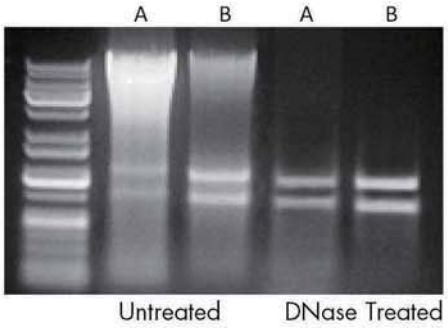

Fig 1. RTS DNase eliminates genomic DNA in RNA. RNA was prepared from two different soils using the RNA PowerSoil® Total RNA Isolation Kit, followed by DNase treatment with the RTS DNase™ Kit. Agarose gel analysis demonstrates the efficient removal of genomic DNA from the RNA sample.

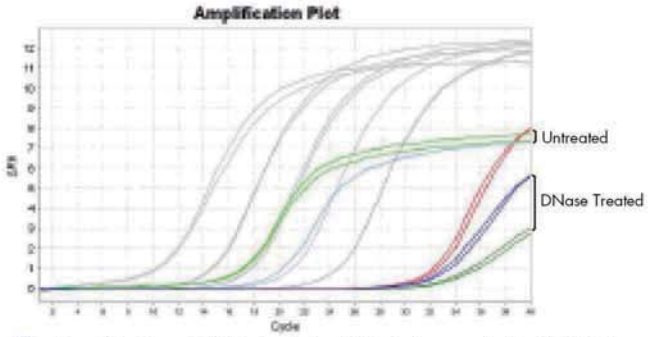

Fig 2. Quantification of DNA levels in RNA before and after RTS DNase treatment. The RNA samples described in Fig. 1 were analyzed using 16S rRNA gene universal primers and a one-step qRT-PCR kit before and after RTS DNase treatment. To quantify the level of reduction of genomic DNA, qRT-PCR was performed using 1 µl of the treated or untreated RNA. Genomic DNA was reduced 5 logs (>15 cycles) and is below the level of background DNA in the template control (red line). The standard curve (grey lines) demonstrates an assay efficiency of 99%.

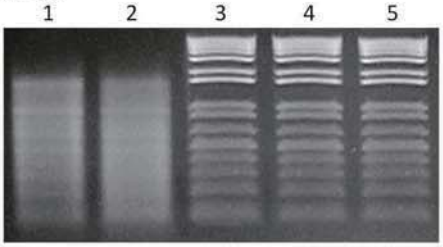

Fig 3. RTS DNase Removal Resin completely removes DNase. Samples were subjected to DNase treatment and enzyme removal using a competitor's kit according to the manufacturer's protocols (lanes 1-2) and the RTS DNase™ Kit (lanes 3-4), and then analyzed for residual DNase activity using the MO BIO DNase-free certification assay. Lane 5 is the negative control and did not receive DNase. Samples were incubated for 1 hour at 37oC, followed by inactivation for 5 minutes at 65°C. Results are shown on a 1% agarose gel. The RTS DNase Removal Resin successfully removed the DNase, while the competitor's resin failed to remove all of the DNase from the samples.

Order information

Catalog No.	Description	Quantity
15200-50	RTS DNase™ Kit	50 preps

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QQ：1362545403

NoviPure™ Soil
Protein Extraction Kit

MO BIO Laboratories, Inc.

Pure Protein. Novel Results.

- ✓ **Cleaner Protein -** Reduces humic substance interference
- ✓ **Higher Yields -** Efficient extraction of intracellular and extracellular microbial protein from only 5 grams of soil
- ✓ **Accurate Results** in mass spectrometry, 1D and 2D gel electrophoresis and other proteomics applications

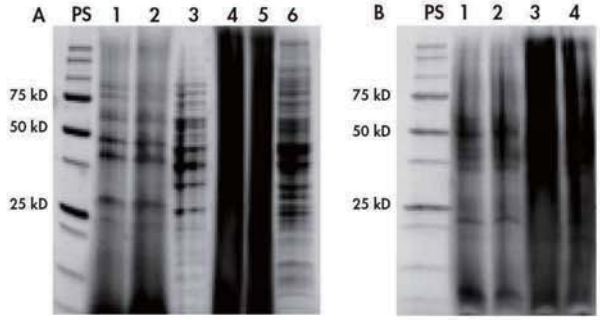
PROTEIN

NoviPure™ Soil Protein Extraction Kit

Pure Protein. Novel Results.

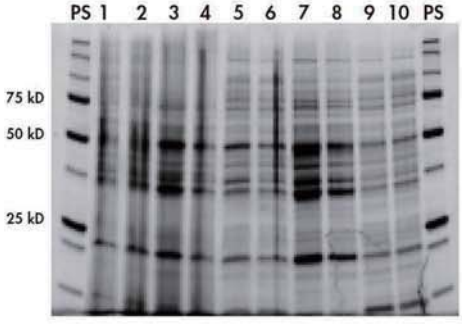
The NoviPure™ Soil Protein Extraction Kit is designed to extract extracellular and intracellular microbial protein from a wide range of soil types without co-extraction of interfering compounds such as humic substances. The patent-pending, two buffer extraction protocol utilizes bead beating with a mixture of glass and ceramic beads to efficiently lyse cells while solubilizing intracellular as well as extracellular protein. The end result is a protein pellet with considerably fewer impurities when compared to traditional extraction methods. The protein can be resuspended in any buffer desired for further analysis or storage. Protein extracted with the NoviPure™ Soil Protein Extraction Kit has been used successfully in 1D and 2D gel electrophoresis and mass spectrometry (2D LC – MS/MS). All reagents and plastics are certified protease and protein free to protect valuable samples.

Figure 1. Cleaner protein is observed in compost samples extracted with NoviPure™ Soil Protein Extraction Kit.



(A) Total protein was extracted from 5 g of sterile compost samples spiked with *C. albicans* using either the NoviPure™ Soil Protein Extraction Kit (samples 1,2) or a method employing sucrose and phenol extractions[1] (4,5). A pure *C. albicans* culture was extracted using the NoviPure™ Soil Protein Extraction Kit (3) or sucrose/phenol as a control (6). (B) Total protein was extracted from 5 g sterile compost samples spiked with *E. coli* using either the NoviPure™ Soil Protein Extraction Kit (samples 1-2) or a method employing SDS and boiling[2] (3,4). Proteins (20 µl per sample) were run on a 1D SDS-PAGE gel and visualized using stain-free gels[3]. In each case, samples extracted with the NoviPure™ Soil Protein Extraction Kit contained fewer humic substances as evidenced by reduced background smearing, making it possible to visualize protein bands on a 1D gel.

Figure 2. High protein yields are observed from challenging soil types using the NoviPure™ Soil Protein Extraction Kit.



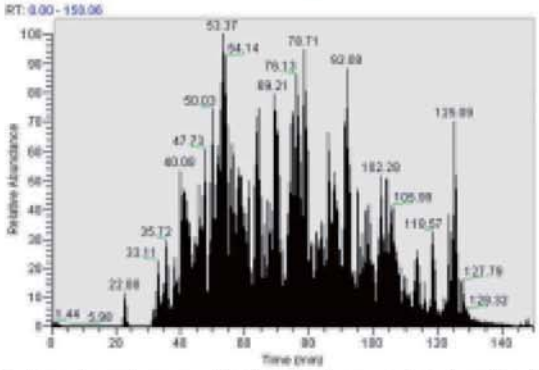
(1,2)-Freshwater Lake Sediment, (3,4)-Lagoon Sediment, (5,6)-Beach Sand, (7,8)-Agricultural Soil, (9,10)-Pure *E. coli* culture

Total protein was extracted from 5 g samples of sterile soil and sediments spiked with *E. coli* using the NoviPure™ Soil Protein Extraction Kit. Proteins (20 µl per sample) were run on a 1D SDS-PAGE gel and visualized using stain-free gels[3]. Protein bands were easily visualized in all cases, and matched the *E. coli* culture control.

Figure 3. Successful results in 2D SDS-PAGE using protein extracted with the NoviPure™ Soil Protein Extraction Kit.

Protein was extracted from 5 g sterile compost samples spiked with *E. coli* using the NoviPure™ Soil Protein Extraction Kit. Proteins (20 µl per sample), were analyzed by 2D SDS-PAGE in the pH range 3-10 and visualized using silver staining. Protein was easily visualized with no interference from humic substances.

Figure 4. Accurate results in 2D LC – MS/MS using protein extracted with the NoviPure™ Soil Protein Extraction Kit.



Total ion chromatogram data showing base peaks of protein. Image is fraction 4 of SCX cation exchange. Protein was extracted from 5 g sterile compost samples spiked with *E. coli* using the NoviPure™ Soil Protein Extraction Kit. Proteins were digested and peptide enriched using reverse phase ion exchange and analyzed with 2D LC – MS/MS. Raw spectra were searched against SwissProt protein database (March 2013 release). 1076 unique proteins were identified.

[1] Taylor & Williams, 2013 Microb. Ecol. 59:390-99
[2] Chourey *et al.* 2010. Jo. Proteome Res. 9:6615-22
[3] BIORAD Mini PROTEAN® TGX Stain-Free™ Gels

Specifications

Extraction Method	Patent-pending two buffer extraction method
Lysis Method	Bead Beating
Starting Amount	2 - 5 g
Equipment Required	Vortex 50 ml MO BIO Vortex Adapter Refrigerated Centrifuge for 50 ml tube (≤4500 x g) Refrigerated Microcentrifuge (20,000 x g)

Order information

Catalog No.	Description	Quantity
30000-20	NoviPure™ Soil Protein Extraction Kit	20 preps

DNA & RNA

PowerClean® Pro
DNA and RNA Clean-Up Kits

Reclaim the possibilities

✓ **Efficient secondary purification** – Fast and easy 7 minute protocol to clean up your problematic DNA or RNA

✓ **Removes challenging impurities** – Purifies nucleic acids containing humic substances, polyphenolics, polysaccharides and other PCR inhibitors

✓ **Successful amplification** - High purity nucleic acids for use in PCR, qPCR and next generation sequencing

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PowerClean® Pro DNA and RNA Kits

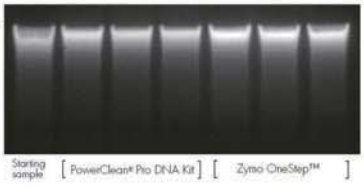
MO BIO Laboratories

Reclaim the possibilities

The PowerClean® Pro DNA and RNA Clean-Up Kits utilize our patented Inhibitor Removal Technology® (IRT) to provide researchers with a novel and proprietary method for cleaning up previously isolated DNA and RNA. The PowerClean® Pro DNA Clean-Up Kit is a significantly streamlined improvement over the original PowerClean® DNA Clean-Up Kit, including fewer steps for a protocol that is twice as fast. The PowerClean® Pro RNA Clean-Up Kit is the only commercially available kit dedicated to secondary RNA purification. The kits will remove PCR inhibitors including humic substances, heme, polysaccharides, polyphenols, fulvic acids, lipids and dyes. The resulting high purity nucleic acids are ready to use in the most demanding downstream applications, including PCR, qPCR and next generation sequencing.

Figure 1. Higher purity by elimination of humic substances from DNA. Samples cleaned up with either the PowerClean® Pro DNA Clean-Up Kit or the Zymo Research OneStep™ PCR Inhibitor Removal Kit were examined on a 1.2% TAE gel (A). The amount, quality and molecular weight of DNA was similar for all samples, regardless of clean-up method. DNA quantification was performed using a NanoDrop 1000 Spectrophotometer (B). The concentration of the starting sample was observed to be artificially high, with low 260/280 and 260/230 ratios, indicating the presence of contaminants that absorb at A230, such as humic substances. Following clean-up with the PowerClean® Pro DNA Kit, the 260/280 and 260/230 ratios increased to levels consistent with pure DNA and the concentration of the DNA decreased to an average of 76.85 ng/µl, a value that was confirmed by quantitation using a Qubit PicoGreen Assay (data not shown). For samples cleaned-up with the OneStep™ Kit, the 260/280 and 260/230 ratios remained low, indicating that inhibitors were still present.

A



B

Sample ID	ng/µl	A260	A280	260/280	260/230	Cursor abs	340 raw
Starting Sample	311.27	6.225	4.565	1.36	0.84	7.450	3.834
PowerClean® Pro DNA	76.85	1.540	0.790	1.95	2.04	0.750	0.030
Zymo OneStep™	143.24	2.860	1.850	1.55	1.18	2.430	0.730

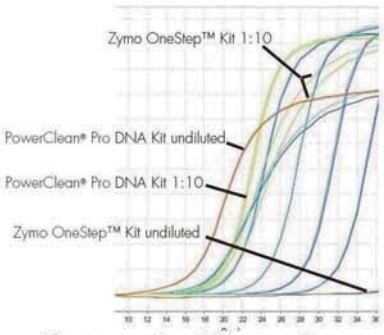
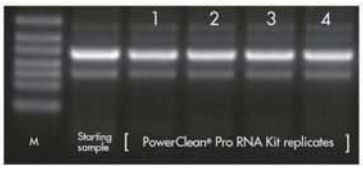


Figure 2. Successful qPCR amplification. DNA described in Fig. 1 was examined via qPCR with a *Bacillus* 16S assay (1µl of undiluted DNA cleaned up using two different methods, or 1:10 dilution). Samples cleaned up with the PowerClean® Pro DNA Kit were free of inhibitors, as indicated by successful amplification and a difference of approximately 3 cycles between the undiluted DNA and the 1:10 dilution. Undiluted samples cleaned up with the Zymo OneStep™ Kit failed to amplify, and 1:10 dilutions amplified with a higher Cq value than the PowerClean® Pro 1:10 dilution, indicating that PCR inhibitors remained in the samples.

Figure 3. Elimination of humic acids from RNA. The amount, quality and molecular weight of RNA visualized on the gel was similar for the starting sample and the samples following clean up (A). The starting sample contained humic acids, which absorb at A230. Following clean-up, the 260/280 and 260/230 ratios increased to levels consistent with pure RNA and the concentration of the RNA decreased to an average of 129.93 ng/µl, a value that was confirmed by quantitation using a Qubit PicoGreen Assay (data not shown).

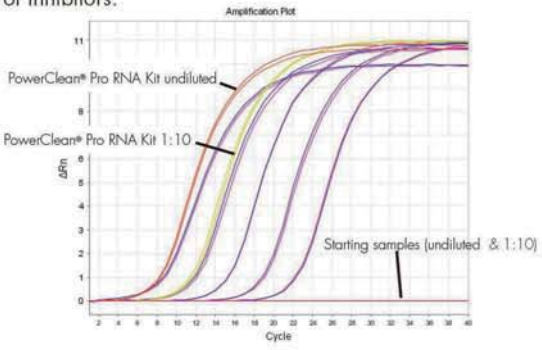
A



B

Sample ID	ng/µl	A260	A280	260/280	260/230	Cursor abs	340 raw
Starting Sample	292.85	7.321	3.902	1.88	0.56	12.990	2.385
1	126.60	3.165	1.512	2.09	2.35	1.349	0.079
2	130.36	3.259	1.567	2.08	2.36	1.383	0.070
3	129.14	3.229	1.528	2.11	2.37	1.361	0.084
4	133.63	3.341	1.598	2.09	2.35	1.424	0.111

Figure 4. Successful RT-qPCR. RNA described in Fig. 3 was examined via RT-qPCR with a *Bacillus* 16S assay (1µl of undiluted RNA or a 1:10 dilution). Samples were free of inhibitors, as indicated by successful amplification of the undiluted RNA and a difference of approximately 3 cycles between the undiluted and the 1:10 dilution. Starting samples and 1:10 dilutions failed to amplify due to the presence of inhibitors.



Specifications	PowerClean® Pro DNA Kit	PowerClean® Pro RNA Kit
Format	Silica Spin Filter Tubes	Silica Spin Filter Tubes
Binding Capacity	Up to 20 µg per filter	Up to 40 µg per filter
Sample Size	Up to 100 µl of purified DNA	Up to 100 µl of purified RNA
Nucleic Acids	100bp-50kb, including genomic DNA	Total RNA, with protocol modification for clean-up of small RNA
Throughput	1 - 24 samples	1 - 24 samples
Time	7 minutes	7 minutes
Equipment Required	Vortex & microcentrifuge	Vortex & microcentrifuge

Catalog No.	Description	Units
12997-50	PowerClean® Pro Clean-Up DNA Kit	50 Preps
13997-50	PowerClean® Pro Clean-Up RNA Kit	50 Preps

MO BIO Laboratories, Inc.

DNA Clean-up Kits

Effective and quick methods to clean your DNA

DNA

PowerClean® DNA Clean-Up Kit

Novel secondary clean up method (IRT®) for previously isolated genomic DNA from any source, such as archived DNA or DNA from challenging soil or plant samples.

UltraClean® DNA Clean-Up Kit

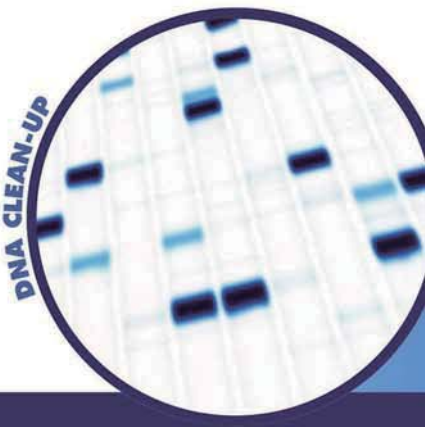
Designed to **purify PCR products** directly from a PCR or enzyme reaction in just 3minutes.

UltraClean® GelSpin® DNA Extraction Kit

Purifies DNA **from agarose gels** in as little as 5 minutes by a simple method to remove ethidium bromide, linkers and labels from TAE or TBE gels.

UltraClean® 15 DNA Purification Kit

Uses economical silica binding particles to extract DNA **from agarose gels and enzymatic reactions.**



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www.mobio.com.cn | Tel: 0755-83489872 | email: anbiosci@126.com | QQ: 1362545403

DNA Clean-up Kits

Effective and quick methods to clean your DNA

PowerClean® DNA Clean-Up Kit

This kit provides a quick, easy and reliable secondary clean-up method to purify previously isolated genomic DNA from any source for all downstream applications. Problematic isolated DNA from soil may be amber to brown in appearance, which is an indicator of PCR inhibiting substances, like humics and polyphenols. Even colorless samples may contain PCR inhibitors which can be cleaned up with this kit. A high level of purity is achieved which allows for more successful PCR amplification from a variety of problematic samples.

UltraClean® GelSpin® DNA Extraction Kit

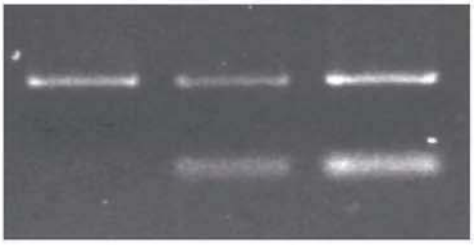
The UltraClean® GelSpin® DNA Extraction Kit utilizes a silica-based spin filter membrane to isolate DNA from agarose gels. After electrophoresis, the desired DNA band is cut from the agarose gel and placed directly in the spin filter column. The kit uses a very simple technique to melt the gel, bind the DNA, wash it and recover it. Popular uses include purification from gels, restriction digests, sequencing reactions (dye removal), radioactive and non-radioactive labeling reactions. The kit also removes all gel stains like ethidium bromide, SYBR® Green and xylene cyanol. The DNA is immediately ready to use for restriction digest, ligation, labeling or PCR.

DNA fragments in lanes 1-12 were recovered from a 100 bp DNA ladder (lane 13) with the UltraClean® GelSpin® DNA Extraction Kit.

UltraClean® DNA Clean-Up Kit

Designed to purify PCR products directly from a PCR or enzyme reaction. If you sequence your PCR reactions or have applications where efficient removal of PCR primers is critical, this kit is your solution.

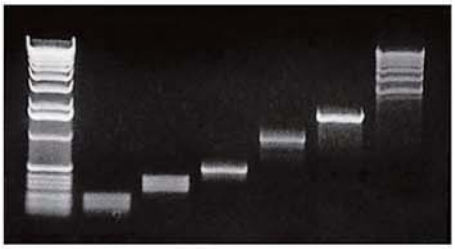
The UltraClean® PCR Clean-Up Kit removes 100% of the unwanted PCR primers



Lane 1: Purification with the UltraClean® PCR Clean-Up Kit.
Lane 2: Purification using another quick kit.
Lane 3: PCR reaction before purification.

UltraClean® 15 DNA Purification Kit

This kit uses economical silica binding particles to extract DNA from agarose gels and enzymatic reactions. These silica particles also provide scale up capabilities for preparative applications when extracting large amounts of DNA. It is ideal for eluting DNA in small quantities. Purified DNA is immediately ready for use in downstream applications including restriction digest, ligation, labeling and PCR.



DNA fragments in lanes 2-7 were recovered from a 1 kb DNA ladder (lane 1) with the UltraClean® 15 DNA Purification Kit.

Order information

Catalog No.	Description	Quantity
12877-50	PowerClean® DNA Clean-Up Kit	50 preps
12500-50	UltraClean® PCR Clean-Up Kit	50 preps
12400-50	UltraClean® GelSpin® DNA Extraction Kit	50 preps
12100-300	UltraClean® 15 DNA Purification Kit	300 preps

www.mobio.com.cn
Tel: 0755-8348 9700
QQ: 1362545403

Homogenization Equipment

Vortex Genie® 2 Vortex

Variable speed laboratory mixer

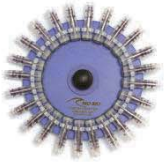
The Vortex Genie® 2 Vortex blends fluids quickly and thoroughly using true vortex action that prevents spilling, even when tubes are uncapped. The Vortex Genie® 2 Vortex is supplied with a pop-off quick change standard cup and a 3-inch (7.6 cm) platform head. Additional **adapters** for processing multiple tubes are available separately (See next page).

Vortex Genie® 2 vortex (220V) - **Cat# 13111-V-220**

Vortex Adapters

Adapters for shaking tubes of various sizes using the Vortex Genie® 2 Vortex

Vortex Adapters are available for 1.5-2.0 ml microfuge, and 5 ml, 15 ml, and 50 ml tubes for bead beating, long mixing times, and custom applications.



Vortex Adapter **13000-V1-24**
Holds 24 (1.5 - 2.0 ml) Tubes

Vortex Adapter **13000-V1-5**
Holds 6 (5.0 ml) Tubes

Vortex Adapter **13000-V1-15**
Holds 4 (15 ml) Tubes

Vortex Adapter **13000-V1-50**
Holds 2 (50 ml) Tubes

PowerLyzer® 24 Bench Top Bead-Based Homogenizer

Efficient and complete sample homogenization and lysis

The PowerLyzer® 24 Bench Top Bead-Based Homogenizer is a bead beating instrument uniquely designed for the most efficient and complete lysis and homogenization of nucleic acids from even the toughest biological samples.

PowerLyzer® 24 Bench Top Bead-Based Homogenizer, (110/220V) - **Cat #13155**

5 ml Tube Adapter Set

Enables homogenization in MO BIO 5 ml bead tubes on the 96 Well Plate Shaker

5 ml Tube Adapter Set - **Cat #11980**

5ml Tube Centrifuge Blocks

For easy centrifugation of MO BIO 5 ml bead tubes in standard 96 well centrifuge buckets.

5 ml Tube Centrifuge Blocks - **Cat #11981**

Plate Adapter Set

Set of four adapters required to assemble two 96 well plates onto the 96 Well Plate Shaker.

Cat #11996

2 ml Tube Holder Set

Allows for homogenization in MO BIO 2 ml bead tubes on the 96 Well Plate Shaker utilizing our Plate Adapter Set.

Cat #11993

Bead Beating Tubes

For rapid and reliable biological sample lysis of a wide variety of sample types

✓ Efficient & consistent hands-off sample homogenization

✓ Compatible with all bead beating machines

Bead beating is the most effective and versatile biological sample lysis method available. MO BIO offers you the ultimate flexibility when lysing and processing virtually any biological sample. Choose from either optimized kits that employ the bead beating lysis method or individual bead tubes for designing your own sample disruption and lysis protocols.

Small Bead Beating Tubes (2.0 ml and 0.5 ml)

Catalog No.	Description	Quantity
13117-50	2.38 mm Metal Bead Tubes	50 x 2.0 ml
13114-50	2.8 mm Ceramic Bead Tubes	50 x 2.0 ml
13113-50	1.4 mm Ceramic Bead Tubes	50 x 2.0 ml
13116-50	0.5 mm Glass Bead Tubes	50 x 2.0 ml
13118-50	0.1 mm Glass Bead Tubes	50 x 2.0 ml
13121-50	0.25 mm Carbide Bead Tubes	50 x 0.5 ml
13122-50	0.15 mm Garnet Bead Tubes	50 x 0.5 ml
13123-50	0.7 mm Garnet Bead Tubes	50 x 2.0 ml

Glass Bead Tubes (0.5 mm & 0.1 mm):
These glass beads are ideal for breaking open microorganisms such as bacteria, fungi, yeast, and spores and are available in two sizes.

Garnet Bead Tubes (0.15 mm & 0.7 mm):
Garnet matrix achieves sample disruption faster than other beads due to the fact that particles have sharp cutting edges and give optimal results with just a vortex. These inert mineral particles do not bind nucleic acids.

Carbide Bead Tubes (0.25 mm):
The carbide matrix is highly effective when isolating RNA from microbes or soil. The beads have an average size of 0.25 mm.

Metal Bead Tubes (2.38 mm):
These high density metal beads are particularly effective in grinding difficult samples and are made with Tough Tubes, the strongest tubes available on the market. Great for plant and seed samples.

Ceramic Bead Tubes (1.4 mm & 2.8 mm): Strong and inert, ceramic beads are versatile for human, animal and plant tissue. The large 2.8 mm bead tubes are made with Tough Tubes and can be used to process RNA from tissues, plants and other challenging samples such as fresh bone. The 1.4 mm small ceramic beads are perfect for low sample volumes.

Which Bead Tube works best with each sample?

		Garnet 0.70 mm*	Garnet 0.15 mm*	Carbide 0.25 mm*	Ceramic 2.8 mm	Ceramic 1.4 mm	Metal 2.38 mm	Glass 0.5 mm	Glass 0.1 mm
Tissue	Tissue	V			V,B		V,B		
	Skin	V			V,B		V,B		
	Hair	V					V,B		
	Nail	V					V,B		
	Bone				V,B		V,B		
	Lung	V			V,B				
	Muscle				V,B		V,B		
	Liver	V			V,B				
	Brain	V				V,B			
	Heart				V,B		V,B		
	Kidney	V				V,B			
	Gonad	V				V,B			
	Insect/ Fly				V,B		V,B		
	Insect/ Tick						V,B		
Microbial	Bacteria		V,B					V,B	V,B
	Yeast		V,B			V,B		V,B	V,B
	Gram +		V,B					V,B	V,B
	Gram -		V,B					V,B	V,B
	Fungi/Mold		V,B					V,B	V,B
	Spores		V,B					V,B	V,B
Plant	Soft Plant Tissue	V					V,B		
	Tough Plant Tissue				B		V,B		
	Seeds				B		V,B		
	Stems				B		V,B		
	Corn						V,B		
	Nuts						V,B		
	Rice						V,B		
	Wheat	V					V,B		
	Leaves	V			B		V,B		
	Arabidopsis	V			B		V,B		
Soil	Soil	V				V,B			
	Coral	V					V,B		
	Marine Sediments	V							
	Sludge	V							
Fecal	Fecal/Stool	V				V,B			
	Scat	V				V,B	V,B		
RNA	Tissue RNA				B		B		
	Microbial RNA			V					
	Plant RNA				B		B		
	Soil RNA			V					

Recommended Methods: **(V)**=Vortex and vortex adapter; **(B)**=Bead beating instrument such as the PowerLyzer™ 24 homogenizer; **(V,B)** = Either method

MO BIO
Laboratories, Inc.

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