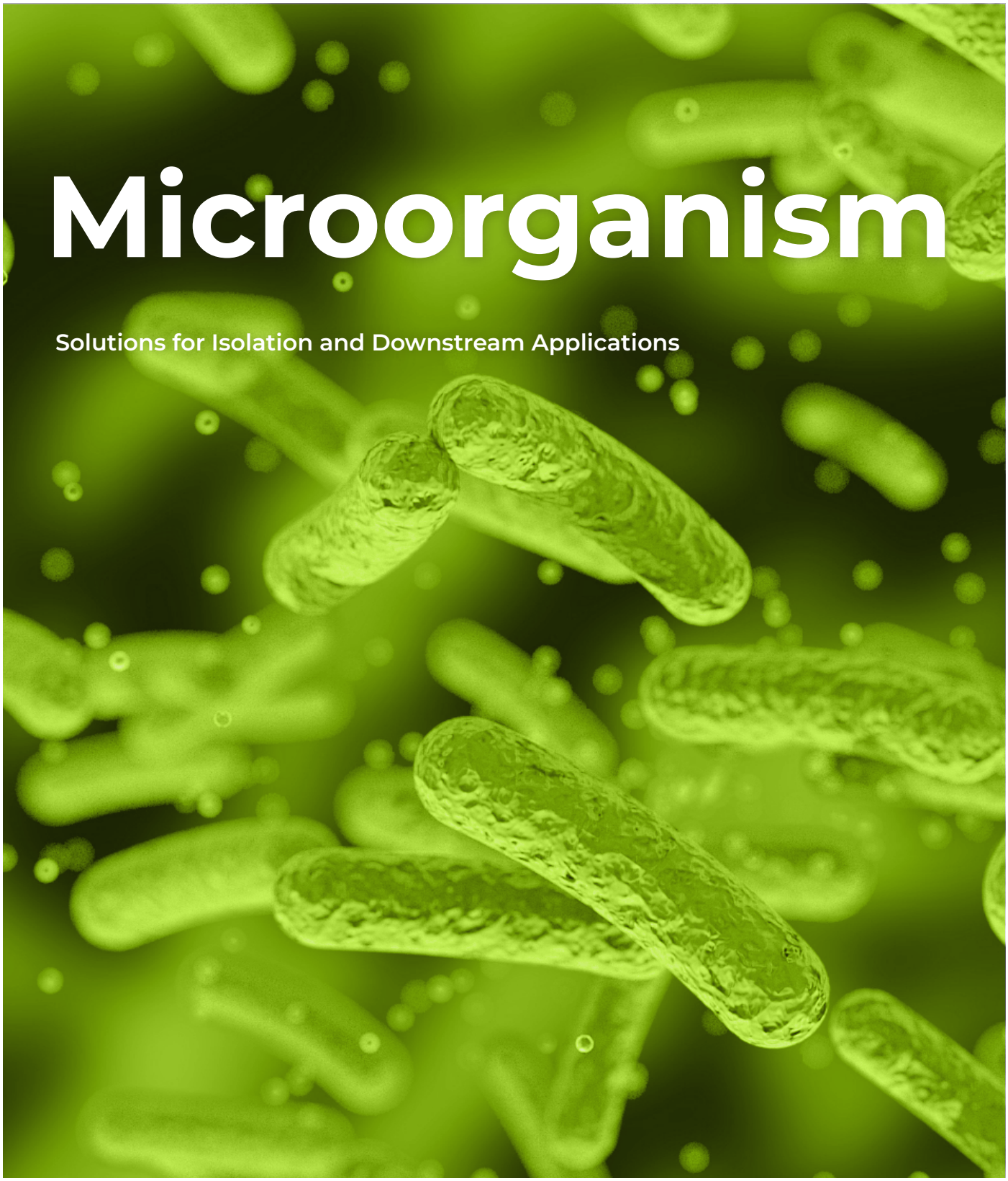
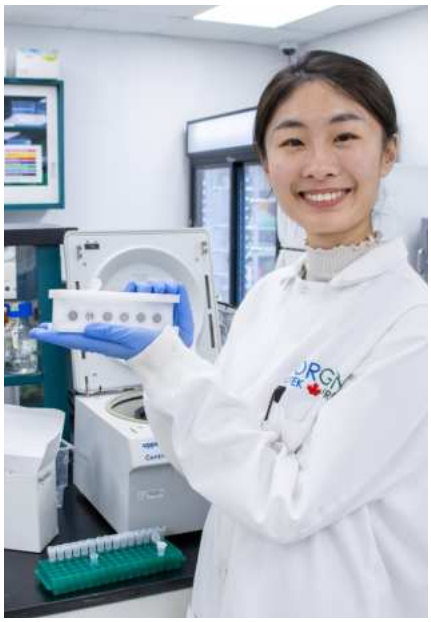
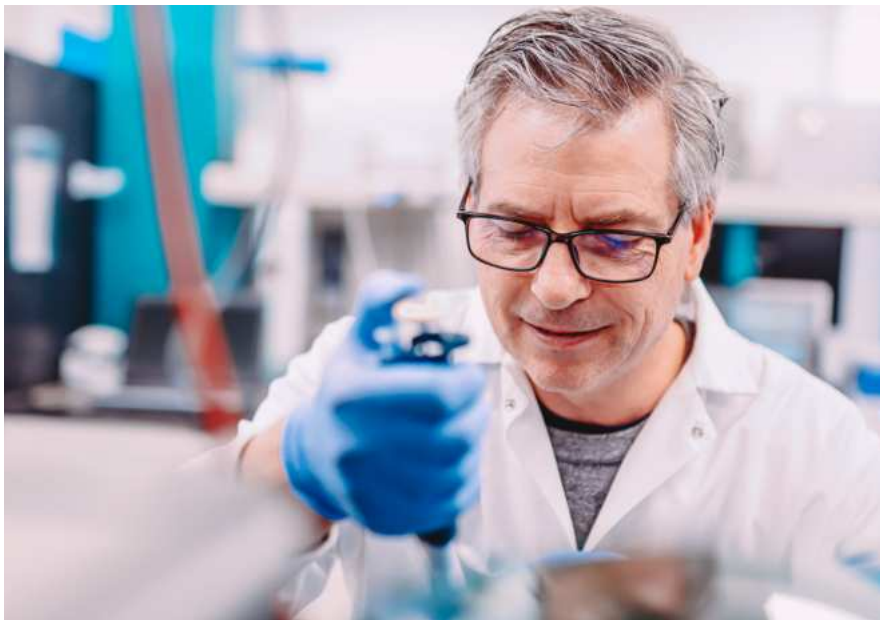
Microorganism

Solutions for Isolation and Downstream Applications



NORGEN BIOTEK






ANALYSIS
FINAL
REPORT

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About Norgen

Norgen Biotek was founded in 1998 by Dr. Yousef Haj-Ahmad. The company is located in a 36,000 square foot state-of-the-art facility in Thorold, Ontario, Canada a few blocks from Brock University. Norgen is an ISO 9001, ISO 13485 and GMP compliant fully-integrated Canadian biotechnology company focusing on developing products for sample collection, sample preparation and sample detection, as well as providing comprehensive research services to the scientific community. Norgen's ISO 9001 and ISO 13485 certifications indicate our commitment to manufacturing and selling high quality products, as well as our commitment to continually improving our company, our products and our quality management system.

Our Mission

Norgen Biotek Corp. is committed to creating customized research experiences for our clients by providing innovative solutions that inspire new discoveries. By ensuring the highest quality products and services, from sample collection and preservation to extraction and detection, our team of experts and global partners can support you every step of the way.

Our Focus

Our team is always working to expand our product and service portfolio for RNA, DNA, exosome, and protein extraction. Our core focus is working with challenging sample types with ultra-low input, but we are passionate about RNA and use our patented Silicon Carbide (SiC) technology to extract the highest quality RNA. Our SiC technology is also used to enhance our clean-up and concentration kits for use in research applications and diagnostics. Apart from sample collection, preservation, extraction, and detection, we are dedicated to providing high quality Next Generation Sequencing Services with an expertise in handling ultra-low concentration sample types, such as liquid biopsies and exosomes.

ISO Certified

Norgen is an ISO 9001:2015 and ISO 13485:2016 certified fully-integrated Canadian biotechnology company focusing on sample collection, preservation and purification for research and diagnostic applications. Norgen's ISO 9001 and ISO 13485 certifications indicate our commitment to design, develop, manufacture and market high quality products, as well as our commitment to continually improve our company, our products and our quality management system.


Bacteria

Bacterial Genomic DNA Isolation Kit

(CAT. 17900, 17950)

For the rapid preparation of genomic DNA from bacteria

- Isolate genomic DNA from all types of bacteria (both Gram-positive and Gram-negative)
- Rapid and convenient spin column protocol
- 96-well format available for high throughput
- High yield, high quality DNA for sensitive downstream applications including sequencing, PCR, qPCR and more

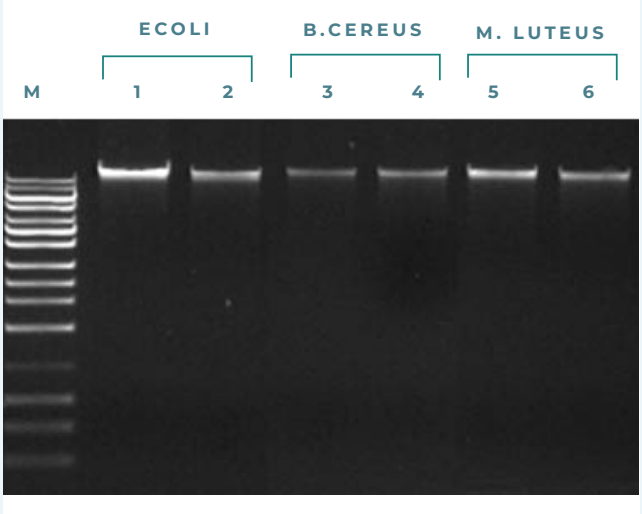


Figure 1. Isolation of Genomic DNA from both Gram Positive and Gram Negative Bacteria. The Bacterial Genomic DNA Isolation Kit was used to isolate genomic DNA from 1 mL overnight culture (1 x 10^9 cells) of the Gram negative bacteria E. coli (Lanes 1 and 2), the lysozyme-resistant Gram positive bacteria B. cereus (Lanes 3 and 4) and the Gram positive bacteria M. luteus (Lanes 5 and 6). Lane M is Norgen's UltraRanger 1kb DNA Ladder. For analysis 5 µL of the 200 µL eluted genomic DNA were loaded on a 1X TAE, 0.9% agarose gel.

Ordering Information

Bacterial Genomic DNA Isolation Kit	
50 Prep	17900
2x96 Well-Plate	17950

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**

Direct DNA Extraction Kit (Bacteria)

(CAT.61500)

For the extraction of DNA from enriched Gram negative and positive bacteria from food and culture samples

- Rapid procedure
- Easy and convenient protocol
- Reproducible
- Applicable for high throughput detection platforms

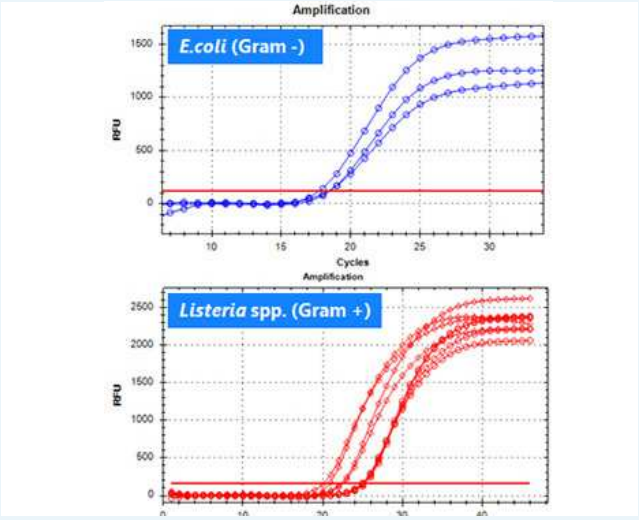


Figure 1. Detection of Gram negative (E.coli) and Gram positive (Listeria spp.) bacteria using Norgen's Direct DNA Extraction Kit (Bacteria) in real-time PCR system. Two microlitres of the clean supernatant was directly added to a PCR reaction (total 20 µL) to detect 16s rRNA target or Listeria spp. specific gene for E.coli and Listeria spp. respectively. Targets were successfully amplified, indicating the high quality of the inhibitor-free DNA that was extracted using Norgen's Direct DNA Extraction Kit (Bacteria). This kit is applicable for rapid and sensitive microorganism detection for food quality monitoring and other high throughput analysis application

Ordering Information

Direct DNA Extraction Kit (Bacteria)	
50 Preps	61500

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**


Fungi/Yeast

Fungi/Yeast Genomic DNA Isolation Kit

(CAT.27300,27350)

For the rapid purification of DNA from yeast cells and fungal spores or mycelium

- Rapid spin column of genomic DNA from viable yeast cells, fungal spores or mycelium, and bacteria including Gram-positive
- 96-well format available for high throughput
- Bead tubes (provided) allow for effective mechanical homogenization
- Purified DNA is of high quality and integrity and compatible with any sensitive downstream applications such as PCR, qPCR, RFLP and more

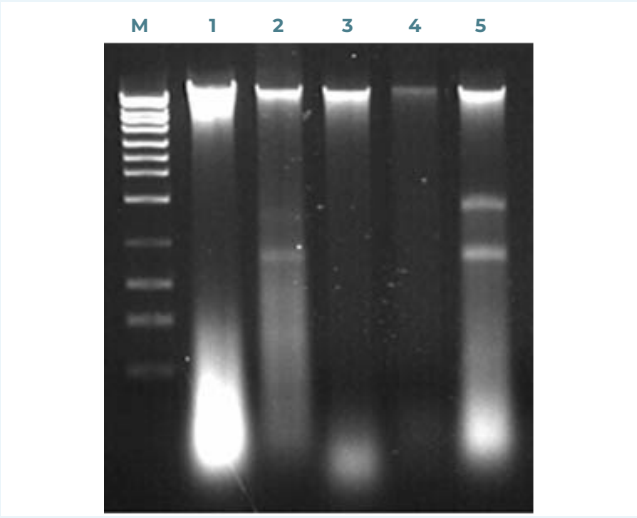


Figure 1. DNA Isolation from Different Fungi Species and Yeast. To demonstrate the purification of DNA from different fungal species, 30 mg of fungi were collected from plate cultures of Pichia sp, Aspergillus niger, Cladosporium cladasporioides, Botrytis cinerea and Mucor racemosus, and the DNA was extracted using Norgen's Fungi/Yeast Genomic DNA Isolation Kit. The bead system efficiently lysed the fungal cell walls with the provided Lysis Solution, and total DNA was eluted in 100 µL. For analysis, 10 µL from each elution was loaded in 1% 1xTAE agarose gel. Lane 1: Yeast (Pichia sp.), Lane 2: Aspergillus Niger; Lane 3: Cladosporium cladosporioides; Lane 4: Botrytis cinerea; Lane 5: Mucor racemosus; Lane M: Norgen's HighRanger 1kb DNA Ladder. The optional RNase treatment was not performed during the process.

Ordering Information

Fungi/Yeast Genomic DNA Isolation Kit	
50 Prep	27300
2 x 96 Well-Plate	27350

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**

Plant/Fungi DNA Isolation Kits

(CAT.26200,26250,26900,58200,62400)

For rapid isolation of total DNA from plants and fungi

- Rapid and simple procedure
- Excellent quality and yield of DNA
- Process a broad spectrum of plant species and filamentous fungi
- Isolate total DNA including pathogen DNA without phenol
- Available in spin column format, magnetic bead system and 96-well format for high throughput applications

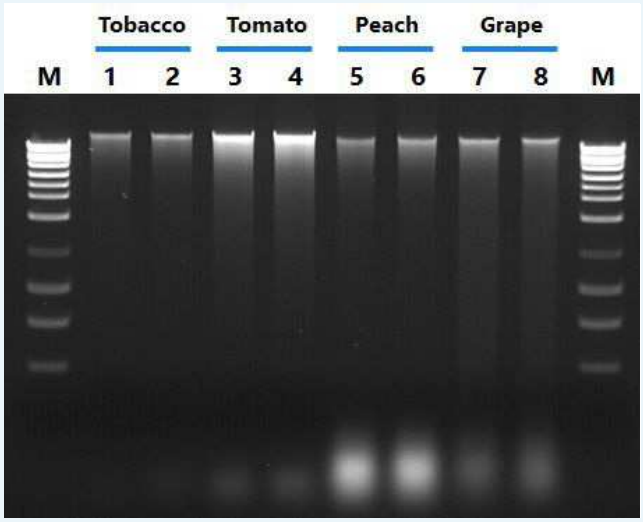


Figure 1. Isolate DNA from a Wide Range of Plants. DNA was isolated from 50 mg samples of tobacco leaves (Lanes 1 and 2), tomato leaves (lanes 3 and 4), peach leaves (Lanes 5 and 6) and grape leaves (lanes 7 and 8) using Norgen's Plant/Fungi DNA Isolation Kit, and 5 µL aliquots of the 100 µL elutions were run on a 1x TAE 1% agarose gel. As it can be seen, high quality DNA was isolated in all cases. The M lanes contain Norgen's HighRanger 1Kb DNA Ladder.

Ordering Information

Plant/Fungi DNA Isolation Kits			
50 Preps	26200	Magnetic Bead System	58200
250 Preps	26250	Magnetic Bead 2x 96 Well Plates	62400
2 x 96-Well Plates	26900		

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**

Plant/Fungi Total RNA Purification Kit

(CAT.25850,31350,25800,31900)

For the rapid purification of total RNA (including microRNA) from plants and fungi

- Extract total RNA, including virus & viroid RNA
- Robust lysis buffer is well-suited to even challenging samples such as pine needle, grape leaf, etc
- Isolate total RNA (including microRNA) without phenol
- Isolated RNA is of high quality, integrity and diversity
- Also available in 96-well format for high throughput applications
- Purification is based on spin column chromatography that uses Norgen's proprietary resin

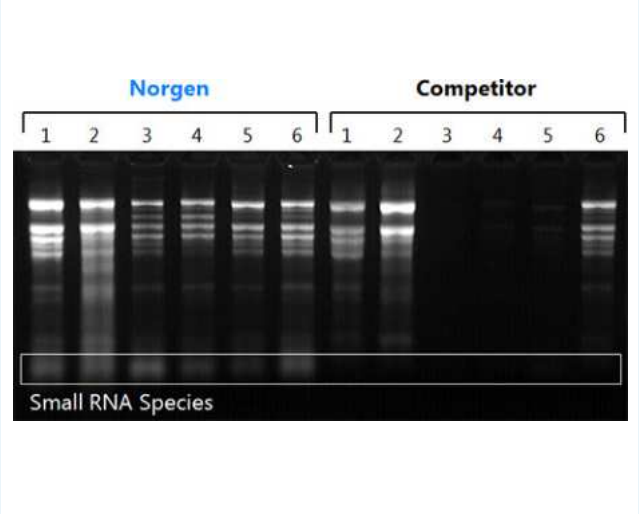
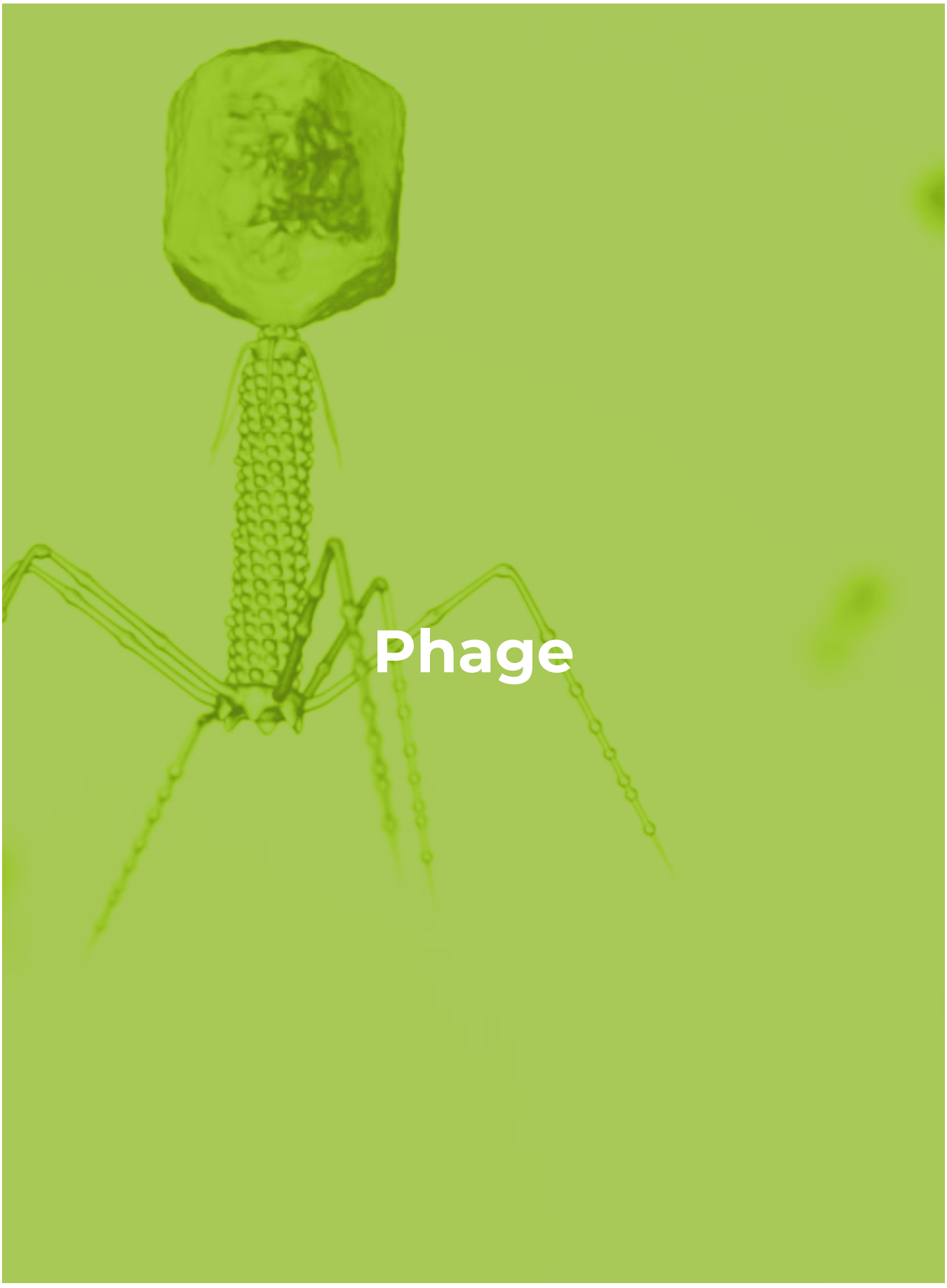


Figure 1. Isolation of High Quality RNA, even from Difficult Samples. Total RNA was isolated from 50 mg samples of apple (Lanes 1), peach (Lanes 2), grape (Lanes 3), pine needle (Lanes 4), strawberry (Lanes 5) and pear (Lanes 6) using Norgen's kit and a competitors kit. Five microlitres of total RNA from the 50 µL elution was loaded on 1X MOPS 1.0 % Formaldehyde-Agarose RNA gel for analysis. Norgen's kit allowed for the isolation of high quality RNA from all the samples, including the difficult samples, while the competitor failed to isolate RNA from grape, pine needles and strawberry. Furthermore, only Norgen's kit was able to isolate the small RNA species (white box).

Ordering Information

Plant/Fungi Total RNA Purification Kit	
50 Prep	25800
100 Prep	31350
250 Preps	25850
2 x 96-Well Plates	31900

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**



Phage

Phage DNA Isolation Kit

(CAT.46800, 46850)

For the rapid purification of total DNA from bacteriophages

- Isolate high quality DNA from a broad variety of phage strains
- High yields of total DNA
- Fast and easy processing using a rapid spin-column format
- No phenol or chloroform extractions or cesium chloride banding required
- High yields of DNA recovered 3-15 µg DNA from 10^8-10^{10} pfu/ mL of enriched phages

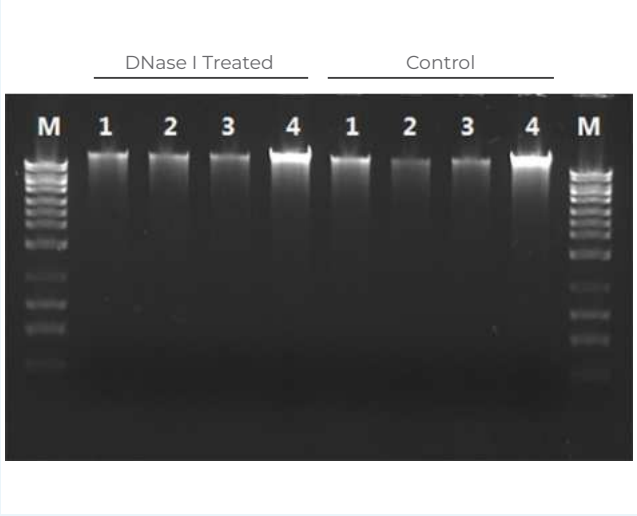
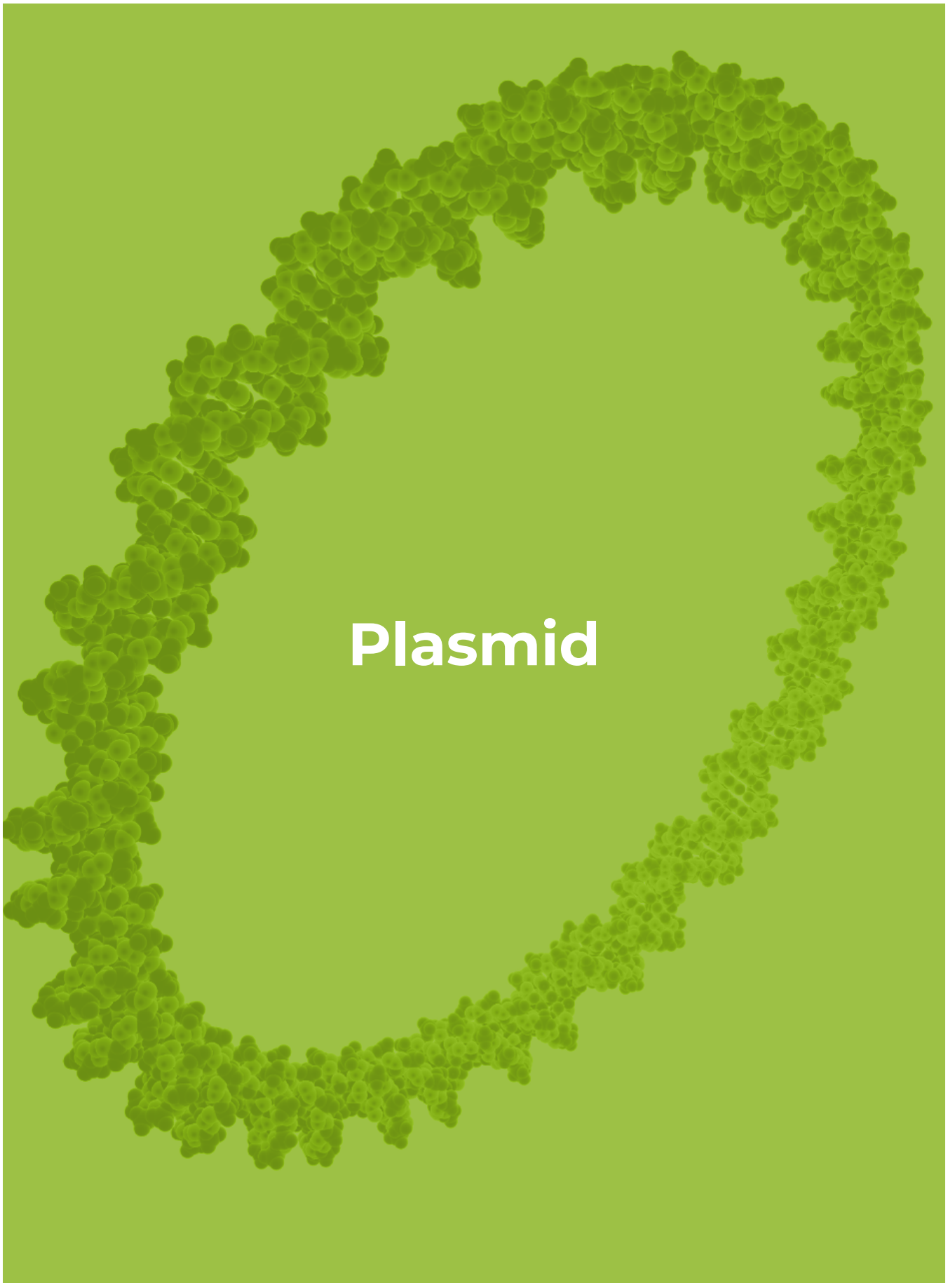


Figure 1. Effective Host Genomic DNA Removal without Reducing Phage DNA Yield. Total DNA was isolated from four enriched phage cultures using Norgen's Phage DNA Isolation Kit. A DNase I pre-treatment was performed prior to adding the provided Lysis Buffer. Briefly, 20 units of DNase I was added to 1 mL of enriched phage culture and the mixture was incubated at room temperature for 20 minutes. After the DNase I treatment the procedure was followed. As a control, DNA was isolated from aliquots of the same 4 cultures using Norgen's Phage DNA Isolation Kit without performing the DNase I treatment. For DNA analysis 10 µL of each 50 µL elution was loaded onto a 1X TAE agarose gel. As it can be seen, the phage DNA was safely protected from the DNase I treatment by its coat protein, while the host genomic DNA was efficiently degraded by the DNase I. Thus the DNase I pre-treatment resulted in less host gDNA contamination in the final phage elution without influencing the total phage DNA yield. Lane M is Norgen's Highranger 1 kb DNA Ladder (Cat. 11900)

Ordering Information

Phage DNA Isolation Kit	
50 Prep	46800
100 Prep	46850

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**


Plasmid

Plasmid MiniPrep Kit

(CAT.13300, 46400)

For rapid and convenient plasmid DNA preparations

- Isolate high quality, high yield plasmid DNA
- These kits are designed for the rapid preparation of plasmid DNA from a variety of bacterial hosts.
- Plasmid DNA is ready for various downstream applications including restriction digestion, bacterial transformation, sequencing and more
- Available in 4 formats: MiniPrep, MiniPrep (Magnetic Bead System), 96-Well MiniPrep (Magnetic Bead System), and MaxiPrep
- Endotoxin removal included in the MaxiPrep kits.

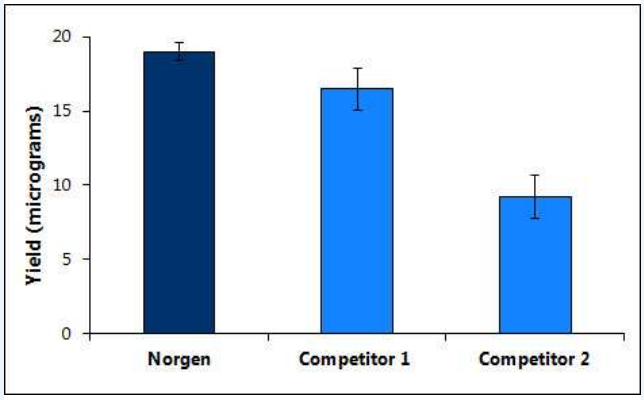


Figure 1. High DNA Yield from Small Cultures. Plasmid DNA from 1 mL overnight bacterial cultures was prepared with Norgen's Plasmid MiniPrep Kit and compared with two other commercial kits. The purifications were performed in triplicate, and the average yield for each kit is shown in the graph. The quantification of the DNA yield was performed by resolving 5 µL of the 50 µL of eluted DNA on a 1X TAE, 0.9% agarose gel followed by densitometry. Norgen shows a significantly higher average yield than the other 2 competitor's kits.

Ordering Information

Plasmid MiniPrep Kit	
50 Prep	13300
250 Prep	46400

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**

Plasmid DNA MaxiPrep Kit

(CAT.46600, 46500, 60300, 63000)

For rapid and convenient plasmid DNA preparations

- Isolate high quality, high yield plasmid DNA
- Plasmid DNA is ready for various downstream applications including restriction digestion, bacterial transformation, sequencing and more
- Available in 4 formats: MiniPrep, MiniPrep (Magnetic Bead System), 96-Well MiniPrep (Magnetic Bead System), and MaxiPrep

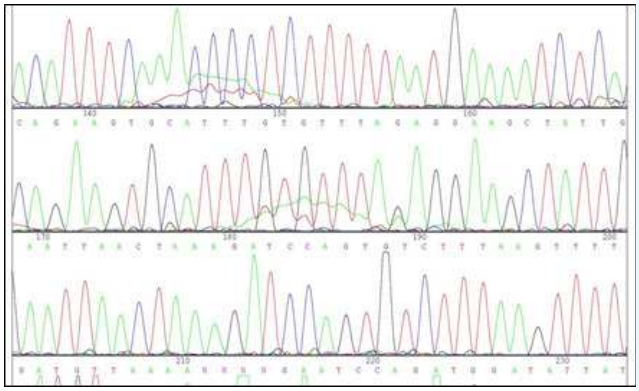


Figure 1. High-Accuracy Sequencing. One microgram of plasmid DNA purified by Norgen's Plasmid Miniprep DNA Kit was used as a template in an Applied Biosystem DNA Sequencer. The result showed an accuracy of >99% over a 950 bp contiguous sequence.

Ordering Information

Plasmid DNA MaxiPrep Kit	
20 Prep	46600
4 Prep	46500
Magnetic Bead System	60300
High Throughput Magnetic Bead System	63000

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**


Food / Milk

Biofilm DNA Isolation Kit

(CAT. 62300)

For the rapid preparation of genomic DNA from biofilm

- Rapid and convenient method to isolate genomic DNA from different types of biofilm and biofilm forming-bacteria
- No phenol or chloroform extractions
- Yields high quality DNA that is ready for PCR and other downstream applications

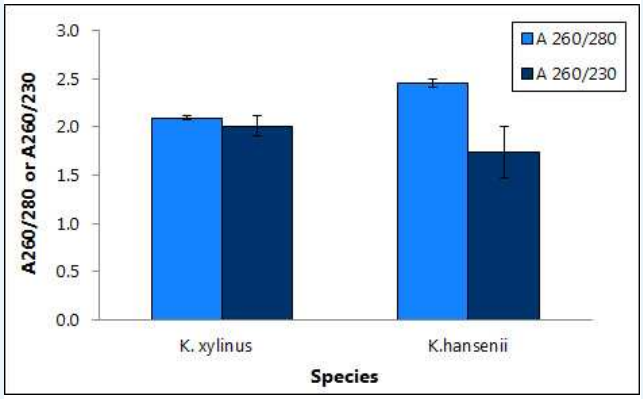


Figure 1. High quality and yield of DNA from biofilm formed by two different species, Komagataeibacter xylinus (1-4), Komagataeibacter hansenii (5-8). Total DNA was isolated from 200 mg of biofilm using Norgen's Biofilm DNA Isolation Kit. For evaluation, 10 µL of each 100 µL DNA elution was run on a 1.2 % agarose gel. Note the high yield and quality of the DNA in all lanes. Lane M: Norgen's HighRanger 1 kb DNA Ladder (cat. 11900).

Ordering Information

Biofilm DNA Isolation Kit	
50 Prep	62300

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**

Food DNA Isolation Kit

(CAT. 54500)

For the isolation of DNA directly from food or from enriched microorganisms

- Isolate DNA from a wide range of food materials. (e.g boiled, fluid, processed or raw food products)
- No hazardous chemicals required (e.g. phenol or chloroform)
- Effective lysis with Proteinase K and optional lysozyme treatment
- Fast (less than 15 minutes hands-on time) and convenient processing using a rapid spin-column format
- Wide compatibility with a variety of food products for GMO-DNA isolation
- Universal protocol for food related pathogen DNA isolation (Gram positive and Gram negative)

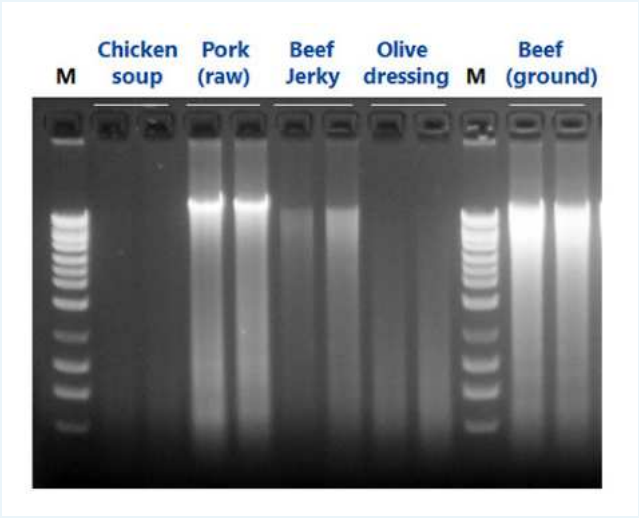


Figure 1. Isolate DNA from a Wide Range of Food Samples. Total genomic DNA was isolated from 200 mg of processed (chicken soup, beef jerky) or non-processed (raw pork, olive dressing, ground beef) food materials using Norgen's Food DNA Isolation kit. Following isolation, 10 µL from each 100 µL elution was loaded on 1% TAE agarose gel. Lane M: Norgen's HighRanger 1kb DNA Ladder.

Ordering Information

Food DNA Isolation Kit	
50 Prep	54500

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**

Milk Bacterial DNA Isolation Kit

(CAT. 21550)

For the rapid purification of genomic DNA from various bacterial species found in milk

- Genomic DNA can be isolated from as few as 10 bacterial cells in 1 mL of milk
- Isolate genomic DNA from both Gram-negative and Gram-positive bacteria in milk
- Can process challenging samples such as mastitic milk
- Inhibitor-free DNA is ready for PCR, qPCR, Southern Blot, sequencing & more
- Fast and efficient spin-column format

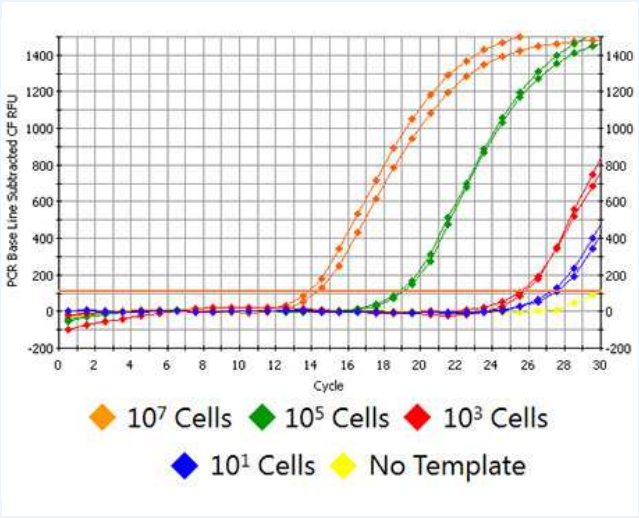


Figure 1. Isolation and Detection of DNA from as Little as 10 Bacterial Cells in 1 mL of Milk. Increasing amounts of E. coli(10^1 cells, 10^3 cells, 10^5 cells, 10^7 cells) were added to 1 mL pasteurized milk samples, and the bacterial DNA was subsequently isolated using Norgen's Milk Bacterial DNA Isolation Kit with a 200 µL elution volume. One microliter of the isolated genomic DNA was then detected in a 20 µL real-time PCR reaction using primers specific to E. coli. Bacterial genomic DNA could be isolated and detected from all the 1 mL milk samples, including the sample that contained only 10 bacterial cells (blue line).

Ordering Information

Milk Bacterial DNA Isolation Kit	
50 Prep	21550

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**

Milk DNA Preservation and Isolation Kit

(CAT. 44800)

A rapid all-in-one procedure for the preservation and isolation of milk DNA at ambient temperatures.

- Milk samples are stable for 1 month at room temperature (or 1 week at 37°C) in the Preservation Solution
- Fast and easy processing using a rapid spin-column format
- DNA can be isolated and detected from as little as 100 µL of milk
- Isolate high quality genomic DNA

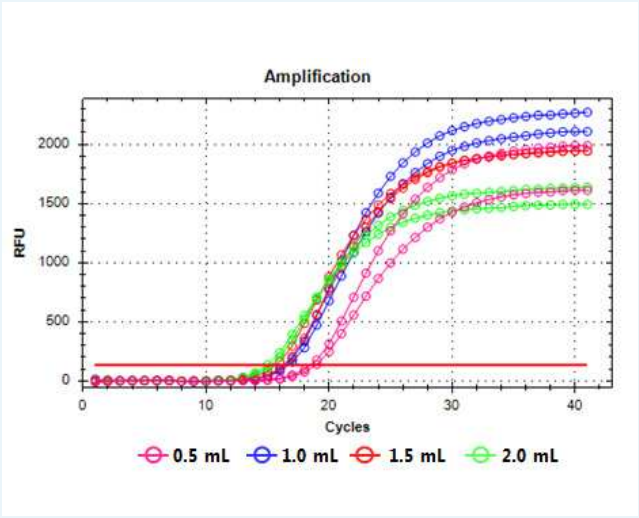


Figure 1. Amplification of 16s rRNA Gene From Different Volumes of Preserved Milk. E.coli was spiked into the preserved milk and the DNA was then isolated using Norgen's Milk DNA Preservation and Isolation Kit (Cat. 44800). Two microlitres of the 100 µL isolated DNA were used in a 20 µL qPCR reaction using TaqMan 16s rRNA qPCR. No PCR inhibition was observed from all milk DNA isolated from the different preserved milk volumes (Pink: 0.5 mL, Blue: 1 mL, Red: 1.5 mL and Green: 2 mL), indicating the high quality of milk DNA.

Ordering Information

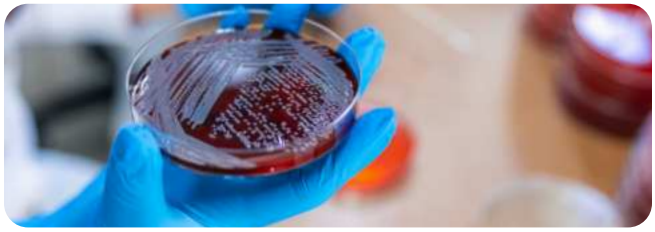
Milk DNA Preservation and Isolation Kit	
25 Preps	44800

For more data and technical specifications please visit **norgenbiotek.com** or scan the **QR code.**

Kit Specifications

Bacterial Genomic DNA Isolation Kit
(CAT. 17900, 17950)

Maximum Input	2 × 10^9 bacterial cells
Maximum Well Binding Capacity	25 µg
Maximum Column Binding Capacity	25 µg
Average Yield*	Up to 20 µg*
Time to Complete 10 Purifications spin columns	1 hour
Time to Complete 10 Purifications (96-Well)	90 minutes



Phage DNA Isolation Kit Spin Column
(CAT.46800, 46850)

Spin Column	
Maximum Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Size of DNA Purified	All sizes
Maximum Amount of Starting Material	1 × 10^{10} pfu/mL enriched phages
Average Yield*	3–15 µg DNA from 10^8–10^{10} pfu/mL of enriched phages
Time to Complete 10 Purifications	45 minutes

Plant/fungi Total RNA Purification Kit
(CAT.25850,31350,25800,31900)

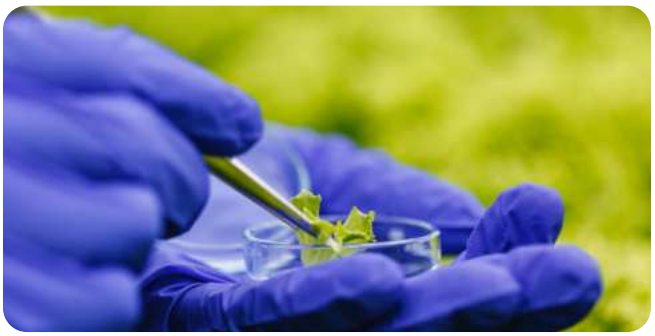
	Spin Column	96-well
Maximum Column Binding Capacity	50 µg	50 µg
Maximum Column Loading Volume	650 µL	500 µL
Size of RNA Purified	All sizes, including small RNA (< 200 nt)	All sizes, including small RNA (< 200 nt)
Maximum Amount of Starting Material:		
Plant Tissues	50 mg	40 mg
Plant Cells	1 × 10^6 cells	
Fungi (wet weight)	50 mg	40 mg
Average Yield*		
50 mg Tomato Leaves	60 µg	20-30 µg
50 mg Tobacco Leaves	60 µg	20-30 µg
50 mg Plum Leaves	35 µg	–
50 mg Grape Leaves	30 µg	5-7 µg
50 mg Peach Leaves	30 µg	15-20 µg
Time to Complete 10 Purifications	30 minutes	30 minutes

Plant/fungi DNA Isolation Kits

(CAT.26200,26250,26900,58200,62400)

	Spin Column	96-well
Maximum Binding Capacity	50 µg	50 µg
Maximum Loading Volume column/ per well	650 µL	
Maximum Amount of Starting Material: Plant Tissues Fungi (wet weight)	100 mg 100 mg	50 mg (wet weight) 50 mg
Size of DNA Purified		All sizes
Average Yields*		
50 mg Tomato Leaves	18 µg	
50 mg Grape Leaves	10 µg	7 µg
50 mg Peach Leaves	10 µg	5 µg
50 mg Plum Leaves	10 µg	4 µg
50 mg Pine Needles	5 µg	
Botrytis cinerea (50 mg wet weight)	1.5 µg	
Fusarium sp. (50 mg wet weight)	2 µg	
Aspergillus niger (50 mg wet weight)	4 µg	
Apple leaf	_	3 µg
Strawberry leaf	_	6 µg
Peach petiole	_	4 µg
Time to Complete 10 Purifications	45 minutes	
Time to Complete 96 Purifications		50 minutes

	Magnetic Bead System	High throughput Magnetic Bead System
Number of Preps	50	192
Maximum Plant Input	50 mg for all types of plant species and tissue	50 mg for all types of plant species and tissue
Average Yield from 50 mg of Plant*	3–10 µg	3–10 µg
Average Purity ($OD_{260/280}$)	1.7–1.9	1.7–1.9
Time to Complete 50 Purifications (automated)	15 minutes (hands-on time)	
Time to Complete 50 Purifications (manual)	40 minutes (hands-on time)	
Time to Complete 96 Purifications (automated)		30 minutes (hands-on time)
Time to Complete 96 Purifications (manual)		60 minutes (hands-on time)



Food DNA Isolation Kit
(CAT. 54500)

Spin Column	
Maximum Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Maximum Amount of Starting Material:	
Solid food material Liquid sample (e.g. milk or concentrated juice)	200 mg 1 mL to 1.5 mL
Time to Complete 10 Purifications	45 minutes

Milk Bacterial DNA Isolation Kit
(CAT. 21550)

Spin Column	
DNA Yield*	500 ng to 8 µg
Bacteria Species Processed	Gram positive and Gram negative
Minimum Detection Limit	10 bacteria in 1 mL of milk
Time to Complete 10 Purifications	1 hour

Milk DNA Preservation & Isolation Kit
(CAT. 44800)

Maximum Milk Input	0.5 mL
Time to Complete 10 Purifications	80 minutes (20 minutes hands on)

Biofilm DNA Isolation Kit
(CAT. 62300)

Spin Column	
Maximum Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Minimum Biofilm Input (wet weight)	50 mg
Maximum Biofilm Input (wet weight)	200 mg
Average Yield from 200 mg of biofilm*	2–4 µg
Time to Complete 10 Purifications	45 minutes

* Average yields will vary depending upon a number of factors including species, growth conditions used and developmental stage.

How To Order

Ready to elevate your RNA research? Whether you're extracting RNA from blood, tissue, or cells, our high-quality solutions ensure reliable results every time. Don't settle for anything less than excellence in your RNA studies. We have 3 ways to order:

1. Online

Visit our website at norgenbiotek.com

2. Email

Send us an email at orders@norgenbiotek.com

3. Phone

Call us at 1.866.667.4362 or 905.227.8848

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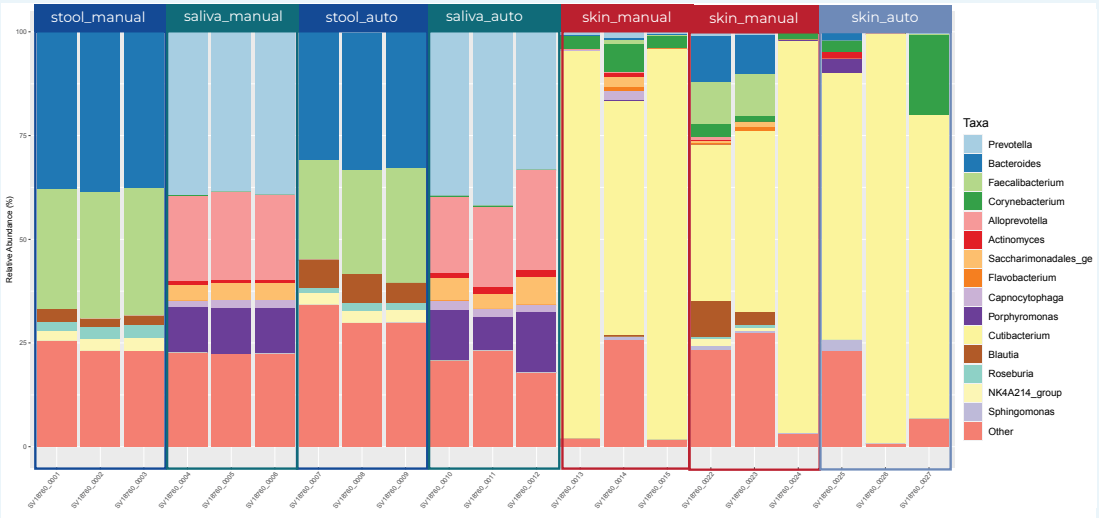

Figure 1. Community composition at the genus level as determined by Illumina sequencing with V3-V4 primers. DNA was extracted from stool, saliva and skin swabs, both manually and automated using magnetic beads.

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