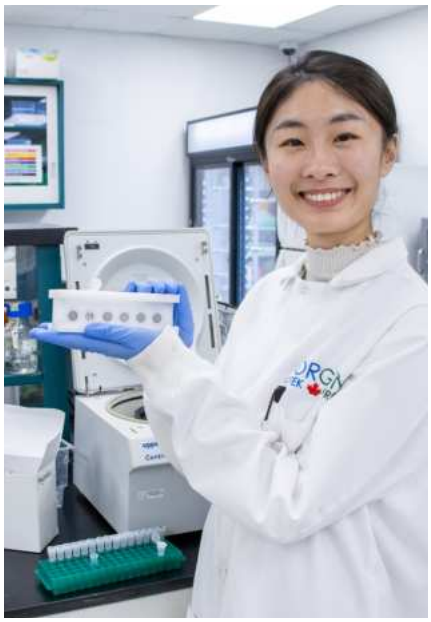
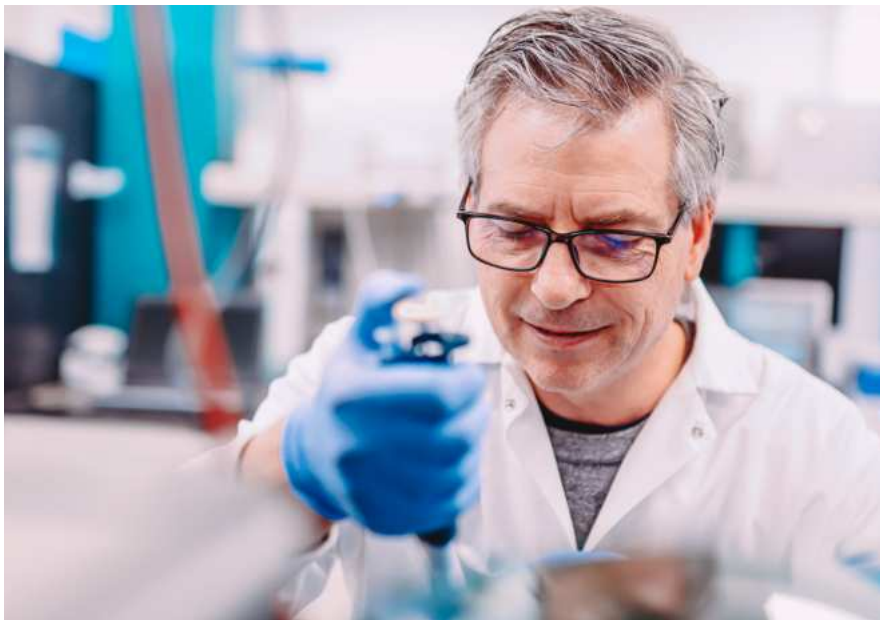
Environment

Solutions for Isolation and Downstream Applications

NORGEN BIOTEK






ANALYSIS
FINAL
REPORT

Table of Contents

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

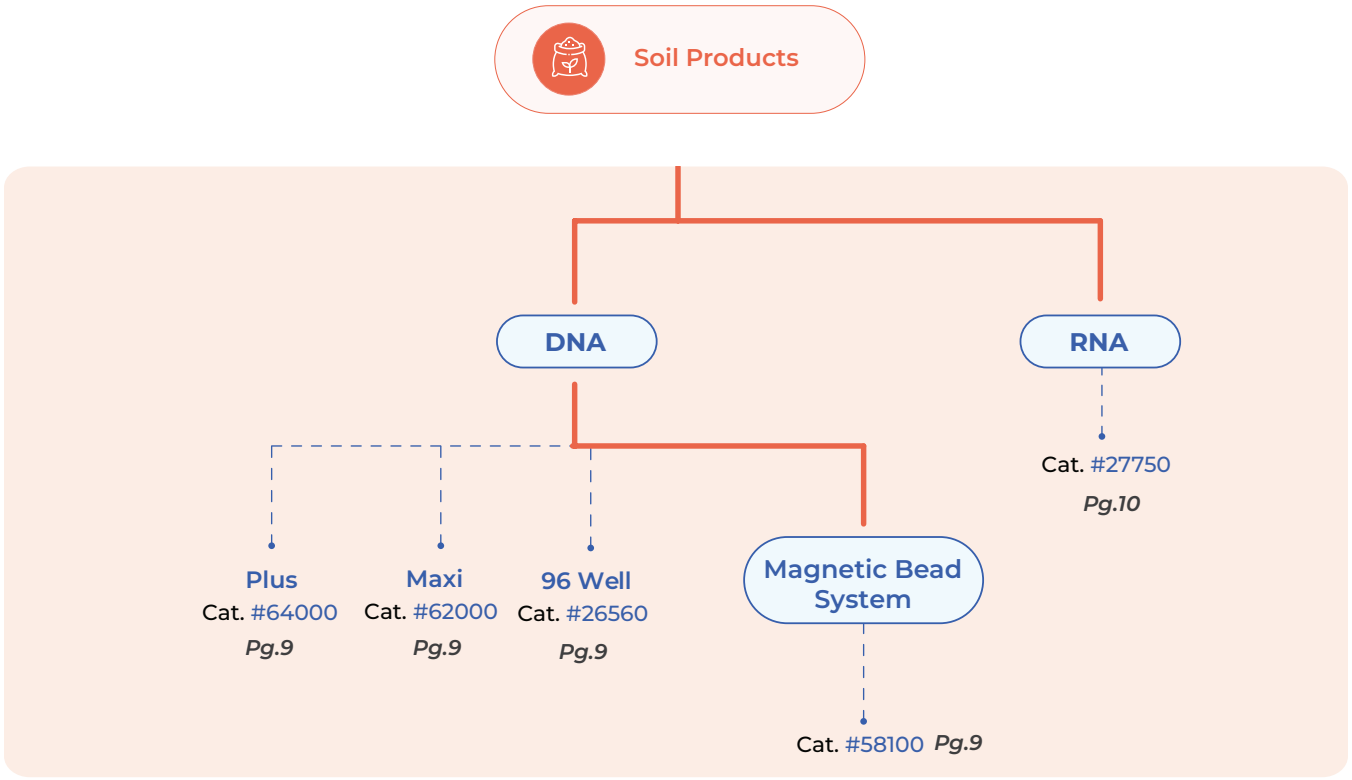
Our team is always working to expand our product and service portfolio for RNA, DNA, exosome, and protein extraction. Our core focus is working with challenging sample types with ultra-low input, but we are passionate about RNA and use our patented Silicon Carbide (SiC) technology to extract the highest 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.

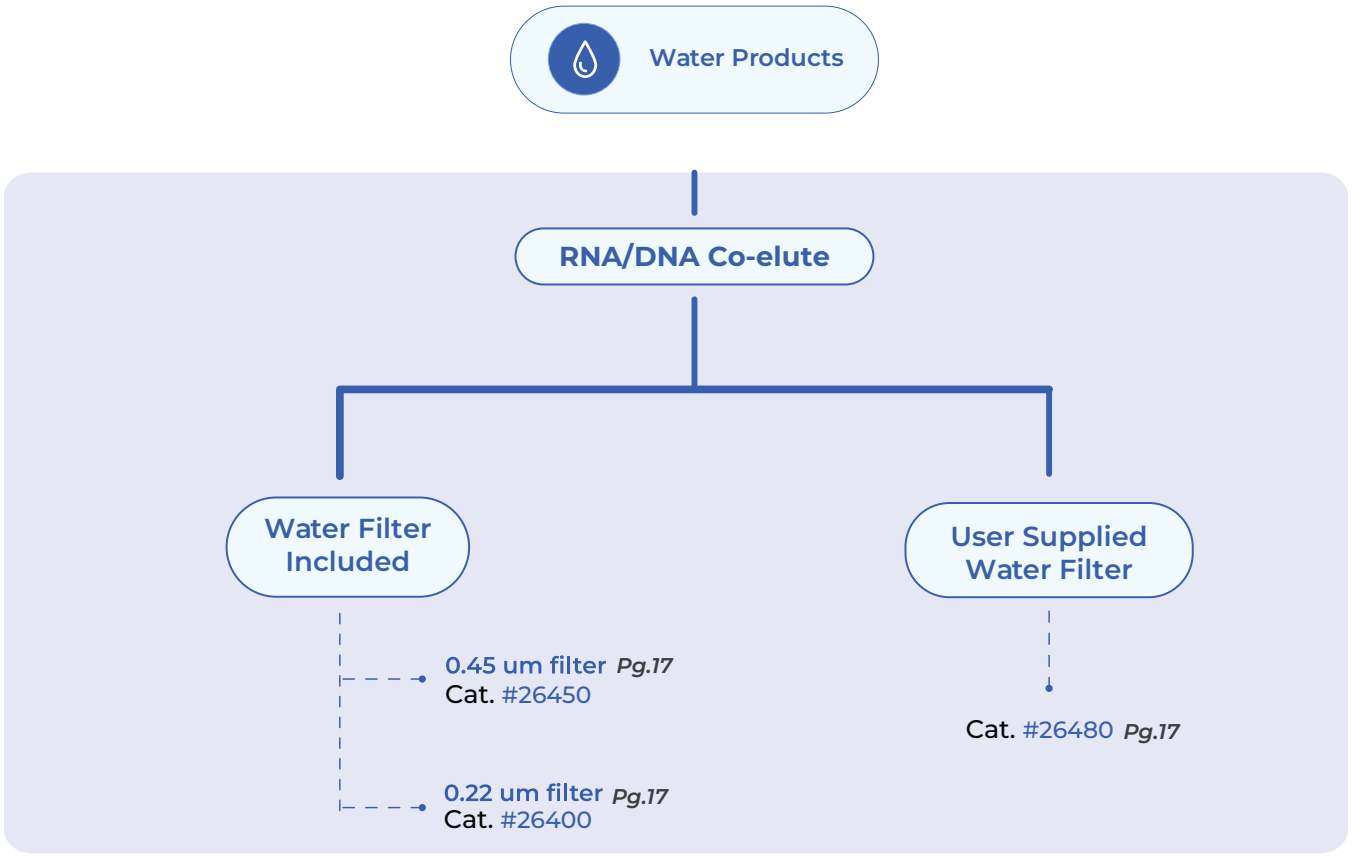
ISO Certified

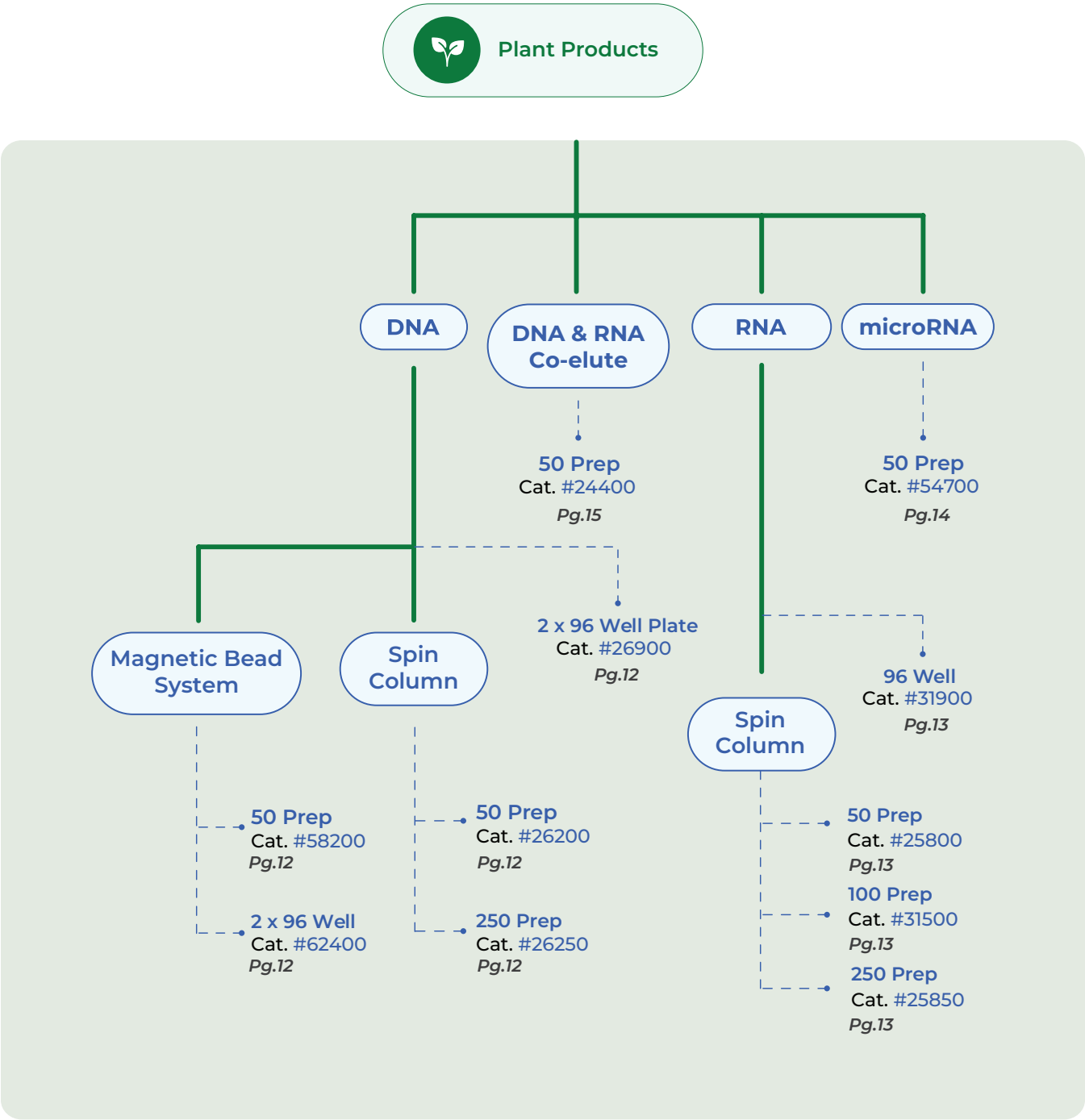
Norgen is an ISO 9001:2015 and ISO 13485:2016 certified fully-integrated Canadian biotechnology company focusing on sample collection, preservation and purification for research and diagnostic applications. Norgen's ISO 9001 and ISO 13485 certifications indicate our commitment to design, develop, manufacture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

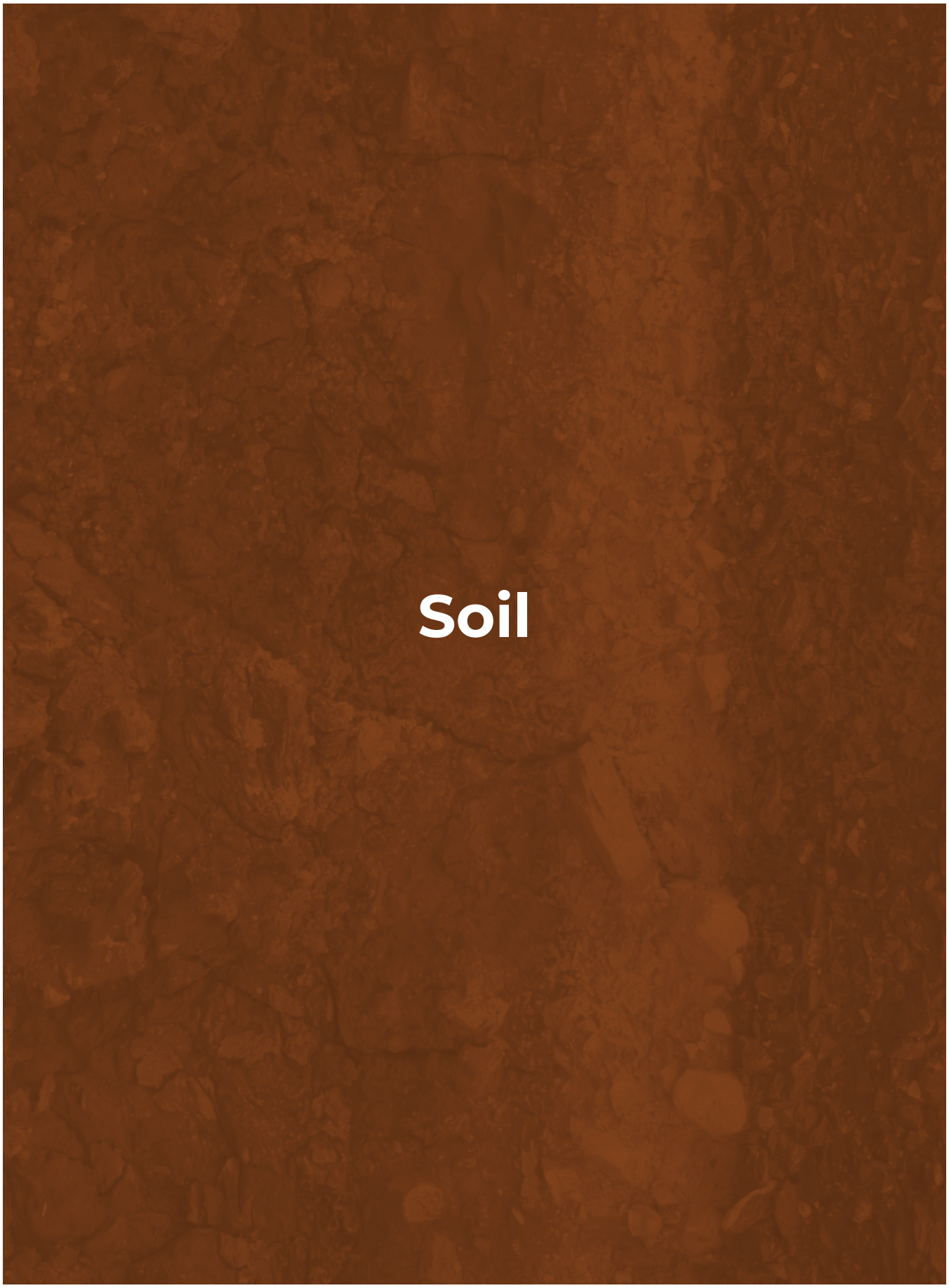
Environmental Roadmap

Start here: A product roadmap to help you navigate all our environmental-based testing solutions.






Plant Products
DNA
DNA & RNA Co-elute
RNA
microRNA
50 Prep
Cat. #24400
Pg.15
50 Prep
Cat. #54700
Pg.14
Magnetic Bead System
Spin Column
2 x 96 Well Plate
Cat. #26900
Pg.12
96 Well
Cat. #31900
Pg.13
Spin Column
50 Prep
Cat. #58200
Pg.12
2 x 96 Well
Cat. #62400
Pg.12
50 Prep
Cat. #26200
Pg.12
250 Prep
Cat. #26250
Pg.12
50 Prep
Cat. #25800
Pg.13
100 Prep
Cat. #31500
Pg.13
250 Prep
Cat. #25850
Pg.13


Soil

Soil DNA Isolation Plus Kit

(CAT. 64000, 62000, 26560, 58100, 62800)

DNA isolation from soil samples

- Fast and easy procedure
- Efficiently remove organic substances, including humic acid
- Isolate high quality total DNA from a variety of microorganisms including bacteria, fungi and algae
- Robust lysis system (chemical lysis combined with a mechanical homogenization)
- Available in spin column (plus or maxi), 96- Well (high throughput) and magnetic bead (automation friendly) formats
- Phenol and chloroform free

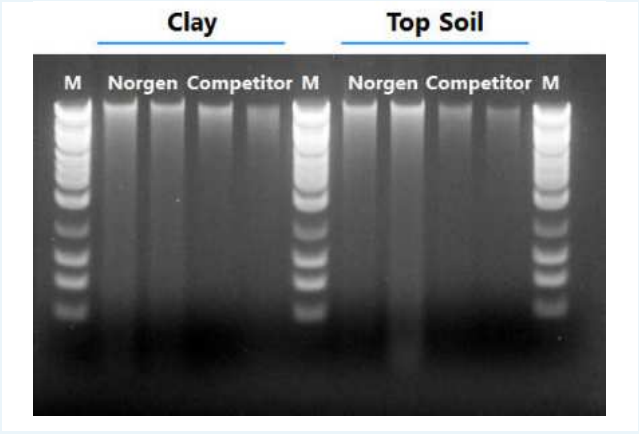


Figure 1: Comparison of DNA Yield from Top Soil and Clay Samples. Norgen's Soil DNA Isolation Plus Kit (Cat. 64000) and Competitor M'S kit were used to isolate DNA from 250 mg of top soil and clay samples. Following isolation, 10 µL from each 100 µL elution was loaded on 1% TAE agarose gel. Lane M: Norgen's HighRanger 1kb DNA Ladder.

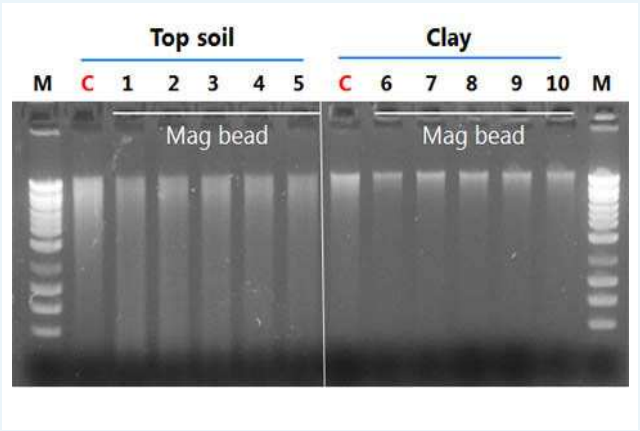


Figure 1. Resolution of DNA isolated from two different types of soil samples. DNA was isolated from high humic acid soil (top soil) and regular soil (clay) using Norgen's column-based Soil DNA Isolation Kit (Red C) and Norgen's Soil DNA Isolation Kit (Magnetic Bead System) (Mag Bead). For evaluation, 10 µL from the 75 µL elution was run on 1X TAE 1.2% agarose gel. Excellent DNA integrity and yield were observed from the Soil DNA Isolation Kit (Magnetic Bead System), indicating the robust performance comparable to the column based method. Marker = Norgen's HighRanger DNA Ladder.

Ordering Information

Soil DNA Isolation Plus Kit	
50 Preps	64000
10 Preps	62000
2 x 96-Well Plates	26560
Magnetic Bead-50 Preps	58100
Magnetic Bead 2 x 96-Well Plates	62800

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

Soil Total RNA Purification Kit

(CAT. 27750)

Total RNA purification from soil samples

- Isolate high quality total RNA from all of soil sample types.
- Remove organic substances, including humic acids
- Isolates all sizes of RNA, including microRNA
- Fast and easy purification based on spin column chromatography using Norgen's proprietary resin
- Phenol and chloroform free

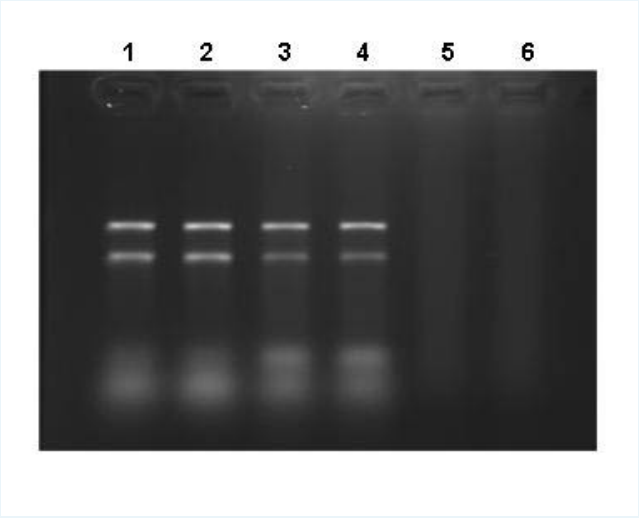
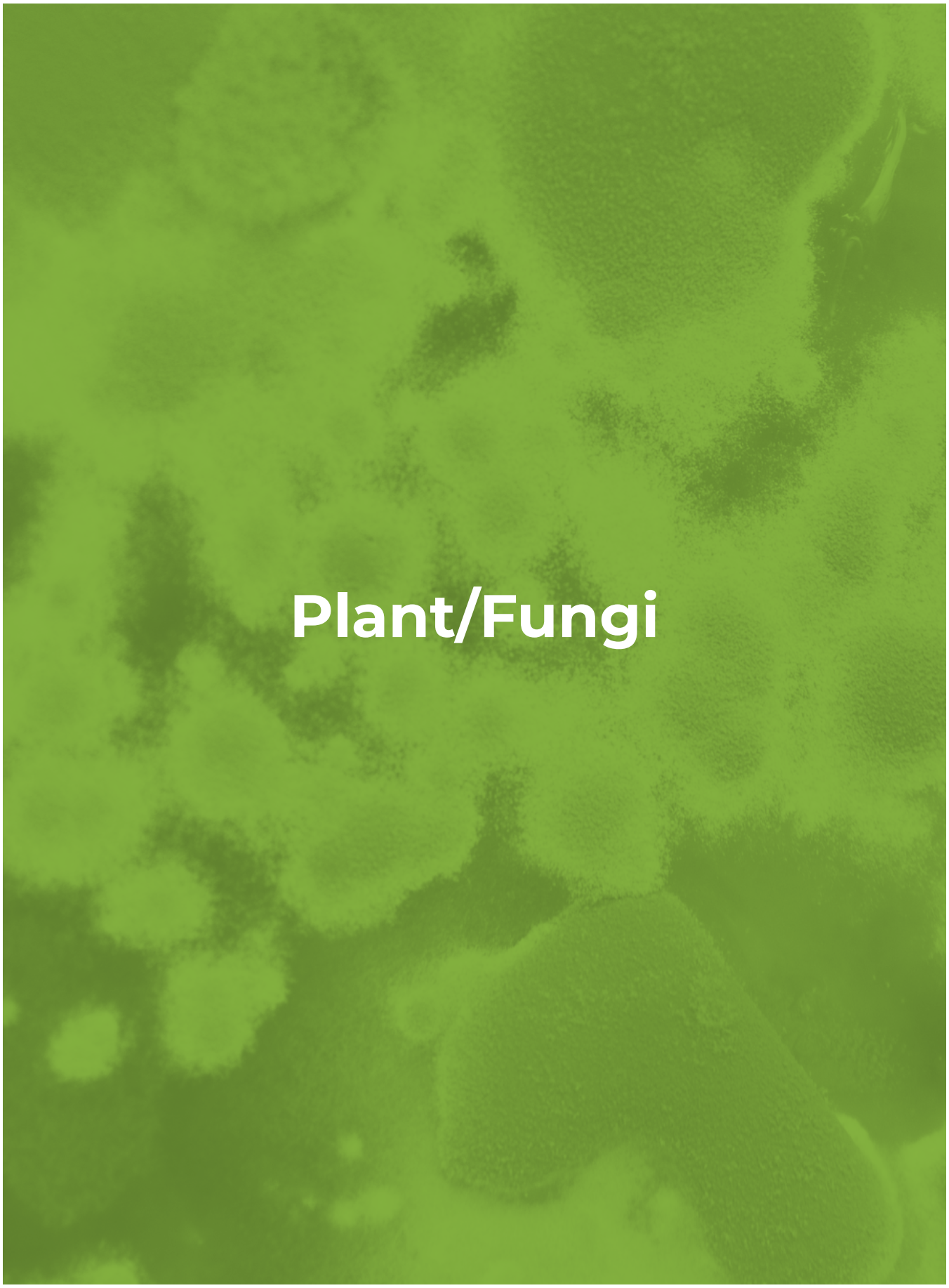


Figure 1. Isolation of Total RNA from Bacteria in Soil. Pseudomonas fluorescens was spiked into 250 mg samples of autoclaved soil and total RNA was isolated using Norgen's Soil Total RNA Purification Kit. RNA was visualized by running 7.5 µL of each 75 µL elution on a 1.2% agarose-formaldehyde RNA gel. Total RNA (large and small) of Pseudomonas fluorescens was recovered from the autoclaved spiked soil without any significant degradation, indicating that high integrity RNA can be purified from the microorganisms in the soil. Lanes 1 and 2 contain total RNA from Pseudomonas fluorescens, Lanes 3 and 4 contain total RNA purified from the autoclaved soil spiked with Pseudomonas fluorescens, and Lanes 5 and 6 contain RNA purified from the autoclaved soil (no RNA was found).

Ordering Information

Soil Total RNA Purification Kit	
50 Prep	27750

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


Plant/Fungi

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

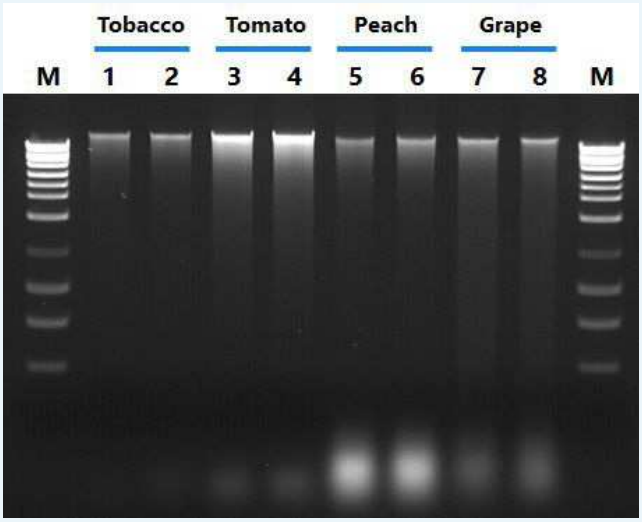


Figure 1. Isolate DNA from a Wide Range of Plants. DNA was isolated from 50 mg samples of tobacco leaves (Lanes 1 and 2), tomato leaves (lanes 3 and 4), peach leaves (Lanes 5 and 6) and grape leaves (lanes 7 and 8) using Norgen's Plant/Fungi DNA Isolation Kit, and 5 µL aliquots of the 100 µL elutions 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

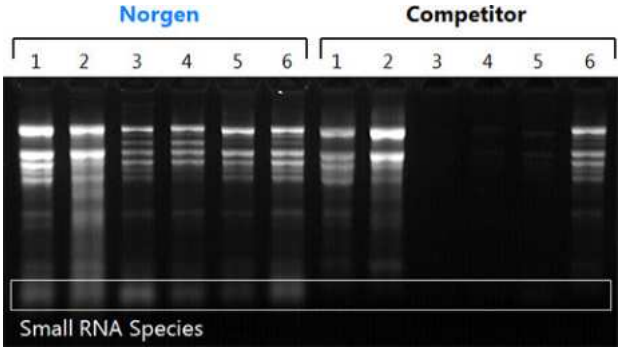


Figure 1. Isolation of High Quality RNA, even from Difficult Samples. Total RNA was isolated from 50 mg samples of apple (Lanes 1), peach (Lanes 2), grape (Lanes 3), pine needle (Lanes 4), strawberry (Lanes 5) and pear (Lanes 6) using Norgen's kit and a competitors kit. Five microlitres of total RNA 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).

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.**

Plant microRNA Purification Kit

(CAT. 54700)

microRNA isolation from plants

- Fast and easy procedure
- Isolate all small RNA molecules (<200 nt)
- Purification is based on spin column chromatography that uses Norgen's proprietary resin
- Phenol and chloroform free

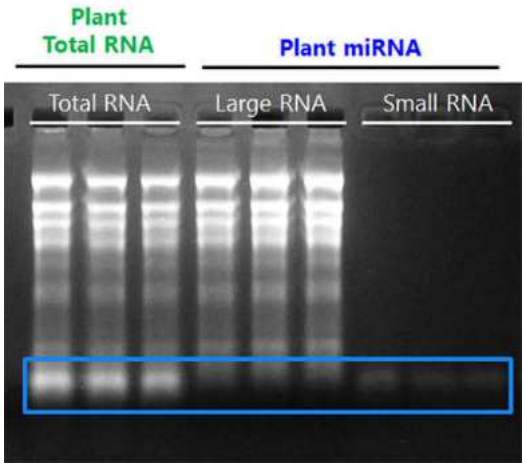


Figure 1. Fractionation of Large and Small RNA. Large RNA and small RNA were sequentially purified using Norgen's Plant miRNA Purification Kit from 50 mg of raspberry leaf tissue and the RNA profile was compared with the RNA isolated using Norgen's Plant/Fungi Total RNA Purification Kit (Cat. #25800). For visualization, 10 µL of RNA from 50 µL of RNA elution was loaded on 2% 1x MOPS agarose gel. Norgen's kit was able to isolate both the large and small RNA fractions, and the small RNA fraction does not contain any of the large RNA species.

Ordering Information

Plant microRNA Purification Kit	
25 Preps	54700

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

Plant RNA/DNA Purification Kit

(CAT. 24400)

For rapid isolation of total DNA from plants and fungi

- Fast and easy procedure
- Robust Lysis Solution processes even the most challenging plant species such as pine needle and grape
- High quality DNA and all sizes of RNA are recovered, including microRNA using the same spin column
- Purification is based on spin column chromatography using Norgen's proprietary resin
- Phenol and chloroform free

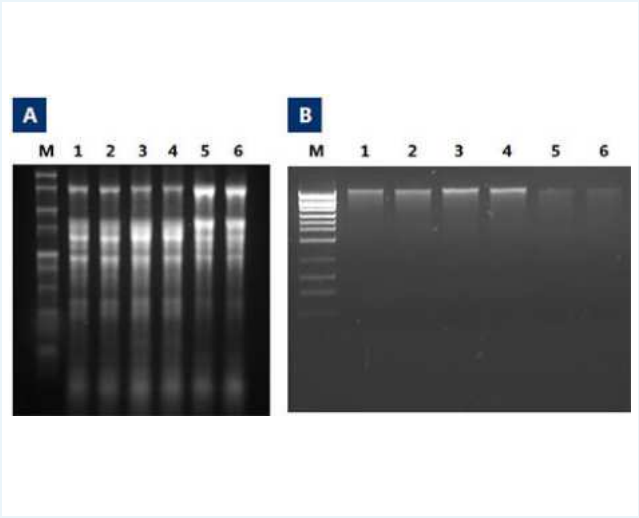
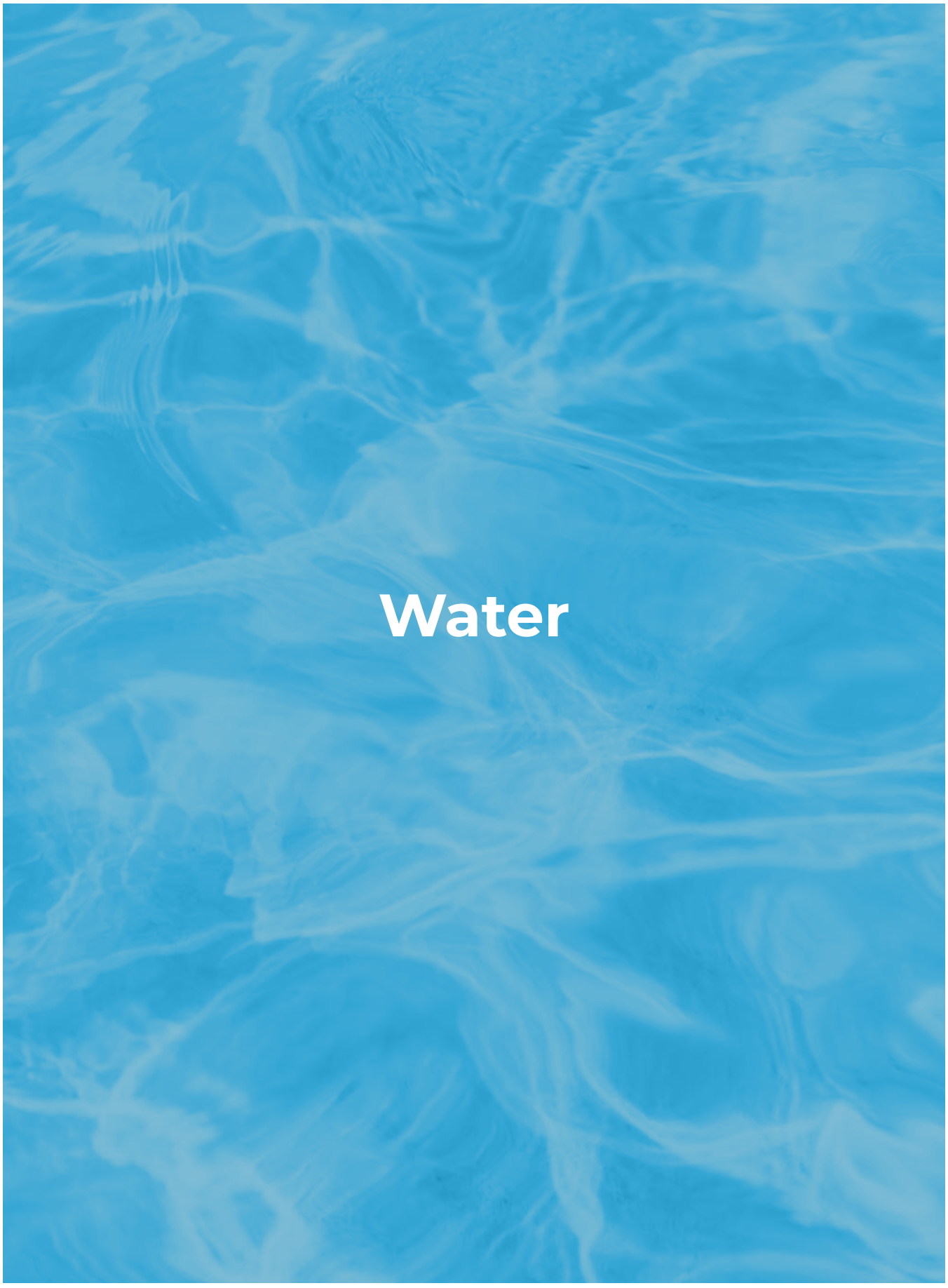


Figure 1. Isolation of Total RNA and Genomic DNA from Tobacco, Tomato and Peach Leaf Tissue. Total RNA and genomic DNA were isolated from 50 mg of tobacco leaf, 50 mg of tomato leaf and 50 mg of peach leaf using Norgen's Plant RNA/DNA Purification Kit. Panel A is a 1X MOPS 1.5% agarose gel showing the total RNA that was isolated after the optional on-column DNase digestion. 5 µL of total RNA from each 75 µL elution was mixed with 2x RNA loading dye and denatured at 70°C for 10 minutes and loaded onto the gel. Lane M is Norgen's 1 kb RNA Ladder, Lanes 1 and 2 contain RNA isolated from tobacco cells, Lanes 3 and 4 contain RNA isolated from tomato cells, and Lanes 5 and 6 contain RNA isolated from peach cells. Panel B is a 1.5% agarose gel containing the genomic DNA that was isolated after the optional on-column RNase digestion, and in each case 10 µL of the 75 µL elution was loaded. Lane M is Norgen's HighRanger 1kb DNA Ladder, Lanes 1 and 2 contain the tobacco DNA, Lanes 3 and 4 contain the tomato DNA, and Lanes 5 and 6 contain the peach DNA. The RNA and DNA are intact and of the highest quality, and can be used in a number of different downstream applications.

Ordering Information

Plant RNA/DNA Purification Kit	
50 Prep	24400

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


Water

Water RNA/DNA Purification Kits

(CAT. 26400, 26450, 26480)

For convenient purification of RNA and DNA from microorganisms in water samples

- Fast and easy procedure
- Isolate total DNA and RNA from all microorganisms found in water, including bacteria, fungi and algae
- High quality RNA and DNA are purified simultaneously using the same column
- Elution contains concentrated DNA and RNA without the need of further precipitation
- Purification is based on spin column chromatography using Norgen's proprietary resin
- Phenol and Chloroform free

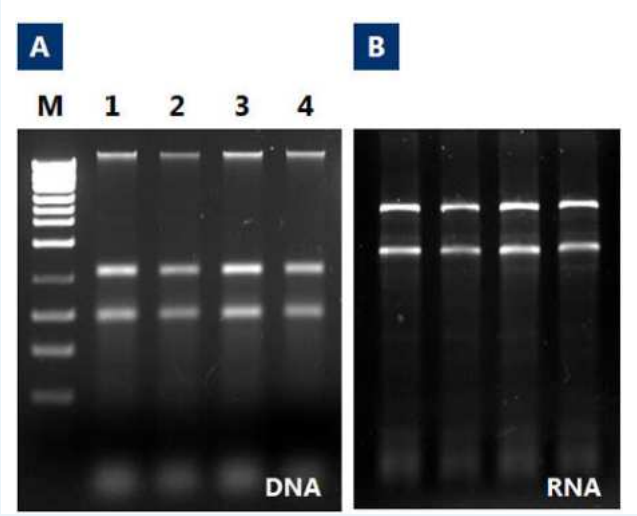


Figure 1. High Yield and Purity of RNA and DNA. Total RNA and DNA were simultaneously isolated from 50 mL of water sample containing 10^7 cfu/mL E.coli using Norgen's Water RNA/DNA Purification Kit and subsequently run on gels for visual analysis. Panel A shows 10 µL aliquots (no RNase treatment) of the 50 µL elutions run on a 1% TAE agarose gel. Genomic DNA and 16S and 23S rRNA bands were visible. Panel B shows 5 µL aliquots (on-column DNase was applied) of the elution run on a 1.5% formaldehyde agarose gel. 16S and 23S rRNA was seen without DNA contamination. From observing the gels it can be seen that the kit allows for the isolation and purification of high yields of concentrated and high quality RNA and DNA.

Ordering Information

Water RNA/DNA Purification Kits	
0.22 µm Filter - 25 Preps	26400
0.45 µm Filter - 25 Preps	26450
Spin Column - 50 Preps	26480

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

Kit Specifications

Soil DNA Isolation Plus Kit

(CAT. 64000, 62000, 26560, 58100, 62800)

Spin Column	Plus	Maxi	96-well
Maximum Soil Input	250 mg	10g	250 mg
Type of Soil Processed	All soil types	All soil types	All soil types
Maximum Binding Capacity	50 µg	1.5 mg	50 µg
Maximum Loading Volume Column/ Per Well	650 µL	650 µL	500 µL
Size of DNA purified	All sizes	All sizes	All sizes
Time to Complete 10 Purifications	30 min.	35 min.	-
Time to Complete 96 Purifications	-	-	90 min.

Magnetic Bead System		96-well
Maximum Soil Input	250mg	250mg
Average Yield from 0.25 mL of Soil*	1 - 5 µg	1 - 5 µg
Average Purity (OD260/280)	1.7 - 1.9	1.7 - 1.9
Time to Complete 50 Purifications (manual)	60 min. (hands-on-time)	-
Time to Complete 50 Purifications (automated)	20 min. (hands-on-time)	
Time to Complete 96 Purifications (manual)	-	90 min. (hands-on-time)
Time to Complete 96 Purifications (automated)	-	30 min. (hands-on-time)

Soil Total RNA Purification Kit

(CAT. 27750)

Magnetic Bead System	
Suggested Soil Input (Clay, loam, sand, feces, compost)	500 mg
Type of Soil Processed	All types, including common soil, compost and manure
Maximum Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Size of DNA purified	All sizes
Time to Complete 10 Purifications	30 min.

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 min.	
Time to Complete 96 Purifications		50 min.

	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 min. (hands-on time)	
Time to Complete 50 Purifications (manual)	40 min. (hands-on time)	
Time to Complete 96 Purifications (automated)		30 min. (hands-on time)
Time to Complete 96 Purifications (manual)		60 min. (hands-on time)

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 microRNA Purification Kit

(CAT.54700)

Spin Column	
Maximum Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Minimum Elution Volume	20 µL
Size of RNA Purified	< 200 nt
Amount of Starting Material: Plant Tissues	100 mg 5 × 10^6cells
Plant Cells	1 × 10^6 cells
Fungi (wet weight)	50 mg
Average Yield*	
50 mg Tomato Leaves	60 µg
50 mg Tobacco Leaves	60 µg
50 mg Plum Leaves	35 µg
50 mg Grape Leaves	30 µg
50 mg Peach Leaves	30 µg
Time to Complete 10 Purifications	30 minutes

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

Plant RNA/DNA Purification Kit

(CAT.24400)

Spin Column	
Maximum Column Binding Capacity	50 µg for RNA 15 µg for genomic DNA
Maximum Column Loading Volume	650 µL
Size of RNA Purified	All sizes, including small RNA (< 200 nt)
Maximum Amount of Starting Material: Plant Tissues Plant Cells	100 mg 5×10^6
Average Yields* Peach Leaves (100mg)	40 µg RNA, 5 µg gDNA
Time to Complete 10 Purifications	30 minutes

Water RNA/DNA Purification Kits

(CAT.26480, 26400, 26450)

Spin Column	
Minimum Water Input	10mL
Maximum Water Input	100mL
Maximum Filter Column Loading Volume	20mL
Maximum Spin Column Loading Volume	650 µL
Elution Volume	100 µL
Time to Complete 10 Purifications	45 minutes

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

Enhance your lab with the complete workflow solutions from Norgen.

We understand the intricacies and challenges of modern laboratory research, which is why we offer a comprehensive suite of products designed to streamline every step of your workflow. From sample collection to analysis, Norgen Biotek provides the tools you need to achieve reliable and reproducible results.
Find out more at norgenbiotek.com.

COLLECTION & PRESERVATION | **EXTRACTION** | **APPLICATION**

Metagenomics Sequencing Designed to Discover

16S | ITS | SHALLOW SHOTGUN

In our accredited state-of-the-art laboratory, we offer comprehensive Next-Generation Sequencing (NGS) services to provide full workflow solutions, from DNA isolation and sequencing to advanced bioinformatics analyses for ready-to-publish data. Our experienced staff have extensive expertise working with a variety of environmental and human sample types, including stool, saliva, soil, water and more. We are here to help!

- Comprehensive service for 16S rRNA
- DNA extraction service included
- Illumina® MiSeq sequencing platform
- Easy to challenging sample types including environmental
- Analyze entire bacterial communities with comprehensive bioinformatics analysis
- Identify phylogenetic or taxonomic classifications
- Fast turn around time | 3 - 4 weeks

ADVANCED BIOINFORMATICS ANALYSES

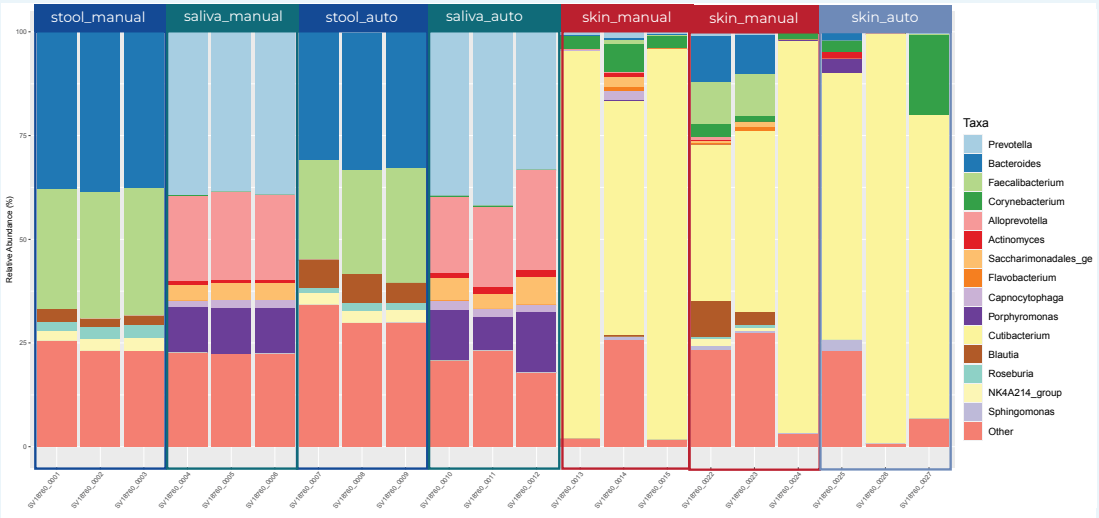


Figure 1. Community composition at the genus level as determined by Illumina sequencing with V3-V4 primers. DNA was extracted from stool, saliva and skin swabs, both manually and automated using magnetic beads.

Contact Our Friendly Staff Today!

Contact us at **services@norgenbiotek.com**

Or find out more at **norgenbiotek.com/services**

Norgen is an ISO registered company,
indicating our commitment to quality

A: Norgen Biotek Corp. 3430 Schmon Pkwy Thorold, ON / Canada L2V 4Y6

P: 905 227 8848

Toll Free: 1-866-NORGENB

E: support@norgenbiotek.com

norgenbiotek.com

V 1.0