

RNA SAMPLE PREPARATION

Isolate total RNA (including microRNA)
from any specimen without phenol



Corporate Headquarters



Norgen Biotek is dedicated to providing our customers with first class sample preparation kits for RNA, microRNA, DNA and protein purification, clean-up and concentration for research and diagnostic applications; and to providing dedicated and expert support services to our customers and commercial partners worldwide.

Norgen is an **ISO 9001:2015** and **ISO 13485:2016** registered company, indicating our commitment to quality.

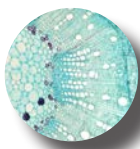




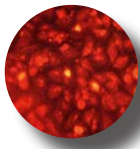
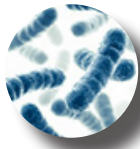
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Total RNA Purification Kit

- Extract high quality & purity total RNA including miRNA
- No phenol step required
- Bind & elute all RNA irrespective of size or GC content, without bias
- Efficiently extract small RNA irrespective of GC content
- Very sensitive & linear down to a few cells without the need for carrier RNA
- Convenient & fast spin column format
- Isolate from a wide variety of specimens

This kit is suitable for the isolation of total RNA from a range of samples including cells, bacteria, yeast, virus and bodily fluids including plasma/serum, blood, saliva, CSF and more. Extract high quality and purity RNA with excellent RIN values and A260/A280 suitable for downstream applications including qRT-PCR, RT-PCR, microarrays, NGS and more.

Kit Specifications

Specifications	
Binding Capacity Per Column	Up to 50 µg RNA
Maximum Loading Volume Per Spin Column	650 µL
Size of RNA Purified	All sizes, including < 200 nt
Time to Complete 10 Purifications	20 minutes

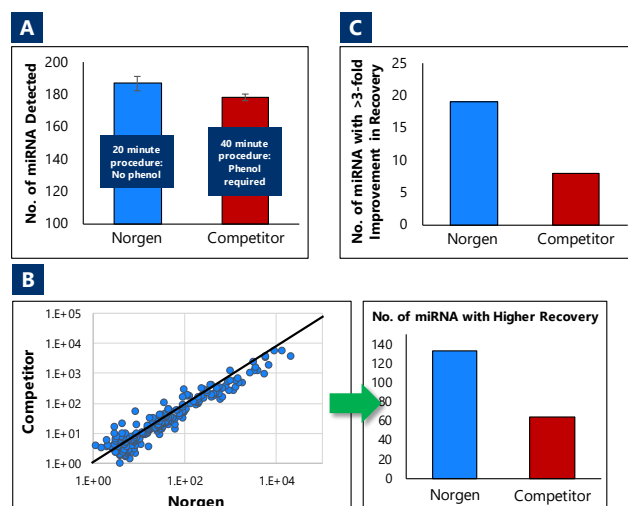


Figure 1. Better Diversity of miRNA Detected from HeLa Cells using Illumina Small RNA Next Gen Sequencing. Norgen's Total RNA Purification Kit isolates miRNA from HeLa cells with better diversity than a leading competitor. Total RNA including miRNA was isolated from 1 million HeLa cells using Norgen's Total RNA Purification Kit and Competitor Q's leading miRNA Kit, and was applied to Illumina Small RNA Next Gen Sequencing on a MiSeq sequencer. Read more details at <https://norgenbiotek.com/17200>

Ordering Information

Product Name	Cat. No.	Size
Total RNA Purification Kit	17200	50 preps
Total RNA Purification Kit	37500	100 preps



Total RNA Purification Plus Kit

- Extract high quality & purity total RNA including miRNA
- No phenol step required; isolate all RNA in one fraction
- Genomic DNA Removal Column for efficient elimination of gDNA
- Efficiently extract small RNA irrespective of GC content
- Very sensitive & linear down to a few cells without the need for carrier RNA

This kit purifies total RNA including miRNA from biological samples and employs an extra column for the efficient removal of contaminating gDNA, thereby replacing the enzymatic DNase step. Efficiently extract total RNA from a range of samples including cells, bacteria, yeast, virus and bodily fluids including plasma/serum, blood, saliva, CSF and more. Extract high quality and purity RNA with excellent RIN values and A260/A280 suitable for downstream applications including qRT-PCR, RT-PCR, microarrays, NGS and more.

Kit Specifications

Specifications	
Maximum Binding Capacity	50 µg
Maximum Loading Volume Per Spin Column	650 µg
Size of RNA Purified	All sizes, including < 200 nt
Time to Complete 10 Purifications	20 minutes
RNA Yield	
HeLa (1 x 10 ⁶)	15 µg
E. coli (1 x 10 ⁹)	50 µg

Ordering Information

Product Name	Cat. No.	Size
Total RNA Purification Plus Kit	48300	50 preps
Total RNA Purification Plus Kit	48400	100 preps

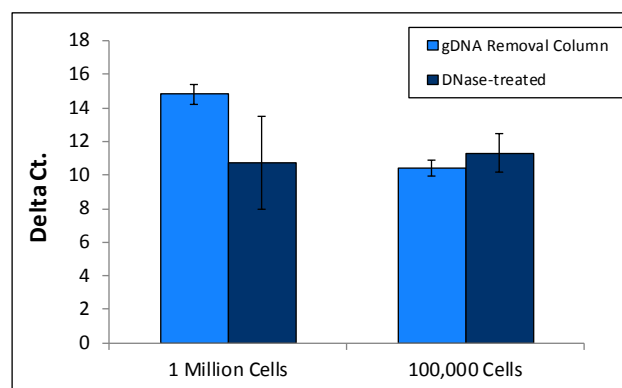


Figure 1. Delta Ct Values Observed Between Different gDNA Removal Techniques. Genomic DNA is well known to contaminate RNA samples, and subsequently RT-qPCR results. Therefore, to determine the amount of genomic DNA contamination in RNA samples, an RT-qPCR can be used to compare Ct values observed with and without reverse transcription of the RNA sample. This is known as the Delta Ct. One million and 1x10⁵ HeLa cells were either passed through the gDNA Removal Column or subjected to DNase-treatment using Norgen's RNase-Free DNase I (Cat# 25710). The gDNA Removal column eliminated gDNA similar to a DNase treatment. For higher inputs (i.e. 1 Million HeLa cells), the gDNA Removal Column successfully removed more gDNA contamination from the RNA samples than the DNase-treatment. When inputs were lowered, the amount of genomic DNA contamination in the DNase-treated sample was similar to the sample passed through the gDNA Removal Column. Both methods work well for removing gDNA contamination in RNA samples.



Total RNA Purification Micro Kit

- Extract high quality & purity total RNA including miRNA
- No phenol step required - isolate all RNA in one fraction
- Elute extracted total RNA in small volume (20 µL)
- Bind & elute all RNA irrespective of size or GC content, without bias.
- Efficiently extract small RNA irrespective of GC content
- Very sensitive & linear down to a few cells without the need for carrier RNA

This kit extracts total RNA from low cell number samples and elutes in a convenient 20 µL elution for a number of downstream applications.

This kit is suitable for the isolation of total RNA from a range of samples including small input of cells, needle biopsies, LCM, CTC and other low cell number samples. Extract high quality and purity RNA with excellent RIN values and A260/A280 suitable for downstream applications including qRT-PCR, RT-PCR, microarrays, NGS and more.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	35 µg
Maximum Column Loading Volume	650 µL
Minimum Elution Volume	20 µL
Size of RNA Purified	All sizes, including small RNA (< 200 nt)
Average Yields* HeLa Cells (1 x 10 ⁵ cells)	1.5 µg

Ordering Information

Product Name	Cat. No.	Size
Total RNA Purification Micro Kit	35300	50 preps

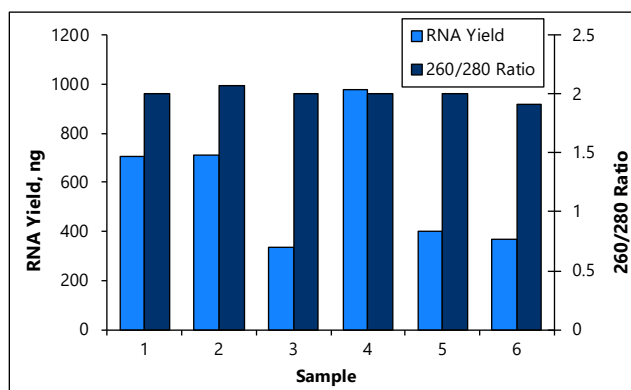


Figure 1. High Quality RNA Isolated from Laser-Captured Microdissection (LCM). Norgen's Total RNA Purification Micro Kit allows sensitive but high quality RNA extraction from small inputs such as Laser-Captured Microdissection (LCM). Total RNA was isolated from 6 different LCM samples. RNA yield and quality (260/280 ratio) were assessed by NanoVue spectrophotometry. Norgen's Total RNA Purification Micro Kit recovered good amounts of RNA with excellent 260/280 ratio.



Total RNA Purification Plus Micro Kit

- Elute extracted total RNA in smaller volume (20 μ L)
- No phenol step required - isolate all RNA in one fraction
- Genomic DNA Removal Column for efficient elimination of gDNA
- Efficiently extract small RNA irrespective of GC content
- Very sensitive & linear down to a few cells without the need for carrier RNA

This kit extracts total RNA from low cell number samples and elutes in a convenient 20 μ L elution suitable for a number of downstream applications. In addition gDNA is removed efficiently with a gDNA removal column and therefore no DNase step is required. Efficiently extract total RNA from a range of samples including small input of cells, small tissues, needle biopsies, LCM, CTC and other low cell number samples. Extract high quality and purity RNA with excellent RIN values and A260/A280 suitable for downstream applications including qRT-PCR, RT-PCR, microarrays, NGS and more.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	35 μ g
Maximum Column Loading Volume	650 μ g
Size of RNA Purified	All sizes, including small RNA (< 200 nt)
Time to Complete 10 Purifications	22 minutes
Average Yields* HeLa Cells (1×10^5 cells)	1.5 μ g

Ordering Information

Product Name	Cat. No.	Size
Total RNA Purification Plus Micro Kit	48500	50 preps

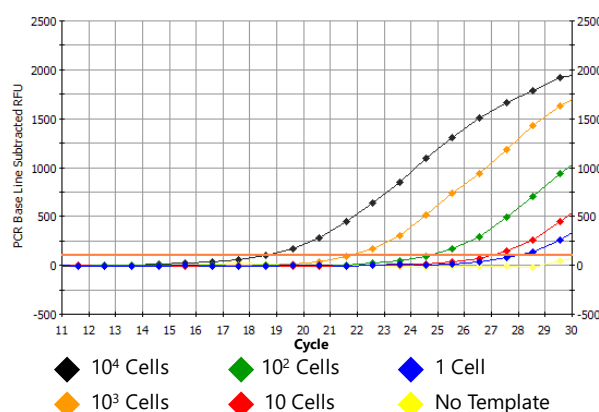


Figure 1. Great Isolation Sensitivity. Norgen's Total RNA Purification Plus Micro Kit allows sensitive RNA extraction from as little as a single cell. Total RNA was extracted from a decreasing number of HeLa cells followed by RT-qPCR to detect the human S14 transcript in the isolated RNA. PCR product of S14 was detected from as little as a single cell.



Total RNA Purification Maxi Kit

- Extract high quality & purity total RNA including miRNA
- No phenol step required - isolate all RNA in one fraction
- Rapid processing in under 40 minutes
- Isolate total RNA from a wide variety of specimens

This kit provides a rapid method for the isolation and purification of total RNA from large inputs of various biological specimens, including cultured animal cells, tissue samples, blood, bacteria, yeast, fungi, plants and viruses. The kit purifies all sizes of RNA including microRNA (miRNA).

The extracted RNA is of a high quality and purity with excellent RIN values and A260/A280 ratios, and can be used in a number of downstream applications including real time RT-PCR, RT-PCR, expression profiling, miRNA profiling, microarrays and Next Generation Sequencing.

Kit Specifications

Specifications	
Column Binding Capacity	1.5 mg
Maximum Column Loading Volume	20 mL
Size of RNA Purified	All sizes, including small RNA (<200 nt)
Time to Complete 4 Purifications	40 minutes
Average Yields*	
HeLa Cells (5 x 10 ⁷ cells)	750 µg
E. coli (2.5 x 10 ¹⁰ cells)	1.5 mg

Ordering Information

Product Name	Cat. No.	Size
Total RNA Purification Maxi Kit	26800	8 preps

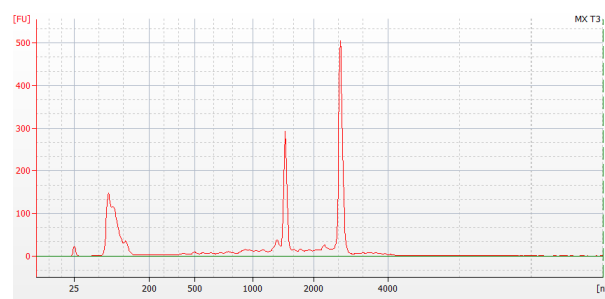


Figure 1. Isolate a Diversity of RNA Species. Total RNA was isolated from 10 mL of an overnight E. coli culture using Norgen's Total RNA Purification Maxi Kit. One microliter of the 2 mL elution was analyzed on an Agilent® 2100 BioAnalyzer RNA Nano 6000 chip. As it can be seen, high quality total RNA was isolated with minimal degradation. As well, a large amount of small RNA (< 200 nt) was recovered, indicating that the kit is able to isolate a diversity of RNA species.



Total RNA Purification 96-Well Kit

- Extract high quality & purity total RNA including miRNA
- Convenient high throughput format for vacuum, centrifuge or robot
- Very consistent well-to-well RNA isolation
- No phenol step required - isolate all RNA in one fraction
- Bind & elute all RNA irrespective of size or GC content, without bias
- Isolate from a wide variety of specimens

This 96-well kit provides a rapid method for the high-throughput isolation and purification of total RNA in 30 minutes using vacuum manifold, plate centrifuge or liquid handlers with vacuum capabilities. Total RNA can be isolated from a broad range of sample sources including cultured cells, tissues, blood, serum, plasma, bacteria, yeast, fungi, and viruses.

Kit Specifications

Specifications	
Binding Capacity Per Well	50 µg
Maximum Loading Volume Per Well	500 µL
Size of RNA Purified	All sizes, including < 200 nt
Time to Complete 96 Purifications	30 minutes
RNA Yield	
HeLa Cells (1 x 10 ⁶ Cells)	15 µg
E. coli (1 x 10 ⁹ cells)	50 µg
Brain (10 mg)	9 µg
Liver (10 mg)	26 µg
Blood (50 µL, Hamster)	1 µg

Ordering Information

Product Name	Cat. No.	Size
Total RNA Purification 96-Well Kit	24300	2 x 96-well plates

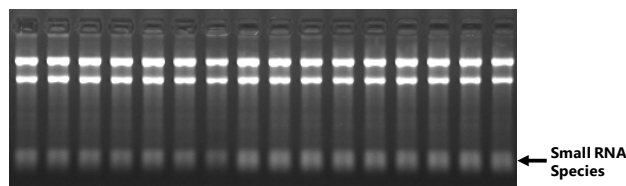


Figure 1. Consistent Yield of High Quality RNA with Complete Size Range without the Use of Phenol. Norgen's Total RNA Purification 96-Well Kit allows for the consistent isolation of high quality RNA, with complete size range from the very large RNA down to small RNA without the use of phenol. Total RNA was isolated from 0.5 mL aliquots of an overnight culture of E. coli (~5 x 10⁸ cells/mL) using Norgen's Total RNA Purification 96-Well Kit in 16 replicates. Five microliters of the 75 µL isolated RNA was resolved on a 1.2% formaldehyde agarose gel. All 16 replicates showed both high yield and high quality. In addition, all replicates showed effective recovery of all sizes of RNA including the small RNA (arrow).

1

RNA Sample Preparation



Animal Tissue RNA Purification Kit

- Extract high quality & purity total RNA including miRNA
- Isolate from a wide variety of animal tissues
- No phenol step required - isolate all RNA in one fraction
- Compatible with tissues stored in RNAlater® or Trizol®
- Convenient & fast spin column format

This kit is suitable for the isolation of total RNA from a range of animal tissues such as liver and spleen, as well as difficult fibrous tissues such as heart, muscle, intestine, etc. Briefly, the tissue of interest is first lysed using Buffer RL, followed by treatment with the provided Proteinase K which aids in the removal of the various proteins present in fiber-rich tissues including collagen, contractile proteins and connective tissues. The purified RNA is of the highest quality and purity, with excellent RIN values and A260/A280, and is suitable for downstream applications including qRT-PCR, RT-PCR, microarrays, NGS and more.

Kit Specifications

Specifications	
Column Binding Capacity	Up to 50 µg RNA
Maximum Column Loading Volume	650 µL
Size of RNA Purified	All sizes, including < 200 nt
Time to Complete 10 Purifications	50 minutes
RNA Yield	
Liver (10mg)	30 µg
Kidney (10mg)	25 µg
Spleen (10mg)	15 µg
Heart (10mg)	10 µg
Muscle (10mg)	5 µg

Ordering Information

Product Name	Cat. No.	Size
Animal Tissue RNA Purification Kit	25700	50 preps

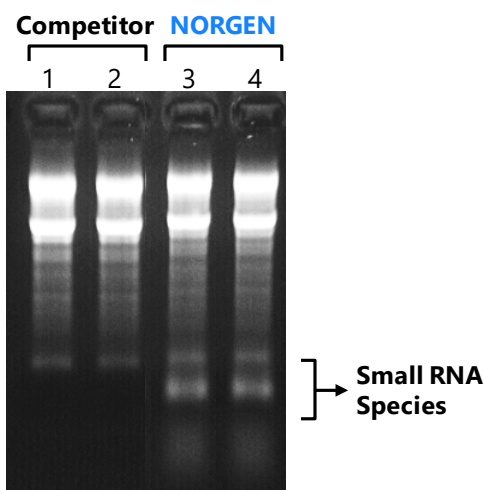


Figure 1. High Quality of Isolated RNA with Complete Size Range. Unlike most competitors kits, Norgen's Animal Tissue RNA Purification Kit allows for the isolation of all sizes of RNA, from the very large RNA down to the microRNA without the use of phenol. Total RNA was isolated from 25 mg samples of rat muscle using Norgens Animal Tissue RNA Purification Kit and a leading competitor's kit. Five microliters of the 50 µL RNA eluted from each kit was then resolved on a 1.2% formaldehyde-agarose gel. As it can be seen, only Norgens kit was able to isolate the full diversity of RNA species, including all the small RNA species.



microRNA Purification Kit

- Extract high quality & purity miRNA in 30 minutes
- Two column kit- eliminate large RNA on first column and capture microRNA on a second column
- Elute microRNA in 25 μ L ready for miRNA profiling
- Process a wide range of samples- cell, tissue, bacteria, bodily fluids, etc

This kit provides a rapid method for the isolation and purification of small RNA molecules (< 200 nt) from cultured animal cells, small tissue samples, bacterial cells, plants and blood.

Two columns are provided with this kit. The first column captures large RNA, while the small RNA are captured on a second column and are eluted concentrated in 25 μ L of nuclease-free water.

Kit Specifications

Specifications

Maximum Column Binding Capacity	Up to 50 μ g RNA
Maximum Column Loading Volume	650 μ L
Size of RNA Purified	All sizes, including < 200 nt
Time to Complete 10 Purifications	25 minutes
Maximum Amount of Starting Material:	
Animal Cells	3×10^6 cells
Animal Tissues	5-25 mg
Bacteria	1×10^9 cells
Plant Tissues	50 mg
Blood	100 μ L

Ordering Information

Product Name	Cat. No.	Size
microRNA Purification Kit	21300	25 preps

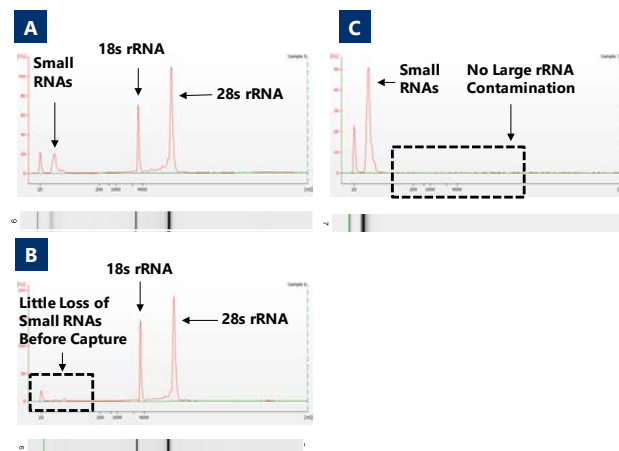


Figure 1. Efficient Removal of Large RNA Species. Different RNA species were isolated from 106 HeLa cells, resolved on an Agilent® Lab-On-A-Chip and electropherograms were generated. Panel A contains all the RNA species present in 106 HeLa cells as isolated with Norgen's Total RNA Purification Kit, and acts as a control. Panel B and C contain RNA that was isolated from 106 HeLa cells using Norgens microRNA Purification Kit. One microliter of the 50 μ L purified RNA for each fraction was loaded. Panel B shows the large RNA species removed using the Large RNA Removal Columns, and no small RNA can be detected. Panel C shows the small RNA that is isolated using the microRNA Enrichment Columns, and shows that there is no contamination of the small RNA with any large RNA species above 200 nt. This demonstrates the effective separation of the small RNA from the large RNA species using Norgen's microRNA Purification Kit.



Single Cell RNA Purification Kit

- Fast and easy processing using rapid micro spin-column format
- Small elution volume of 8 µL ready for direct utilization in qRT-PCR reactions
- Isolate total RNA including microRNA in a concentrated ready to use format
- Isolate high quality total RNA from a variety of sources
- RNA can be isolated from a single cell to 100,000 cells

Very sensitive kit designed to work with as low as a single cell and up to 100,000 cells. The special design of the micro spin-column allows a small elution volume of as little as 8 µL.

Rapid 15 minute method for the isolation and purification of total RNA (including miRNA) from small input amounts of cultured animal cells, CTC, stem cells, immuno-sorted cells, and microdissected samples including laser-capture microdissection (LCM). The purified RNA is of the highest purity and integrity, and can be used in a number of qRT-PCR and digital PCR and other whole transcriptome applications.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	10 µg
Maximum Column Loading Volume	650 µL
Minimum Elution Volume	8 µL
Size of RNA Purified	All sizes, including small RNA (<200 nt)
Time to Complete 10 Purifications	20 minutes
Average Yields HeLa Cells (1 x 10 ⁵ cells)	1.5 µg

Ordering Information

Product Name	Cat. No.	Size
Animal Tissue RNA Purification Kit	51800	50 preps

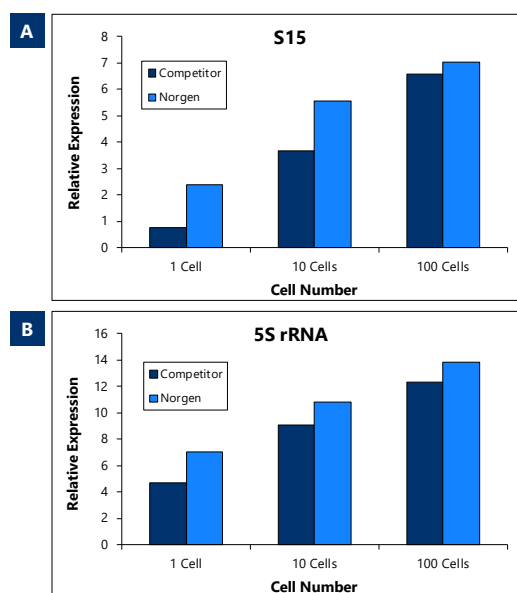


Figure 1. Better Efficiency of RNA Recovery at Single Cell Input. Norgen's Single Cell RNA Purification Kit allows sensitive RNA extraction from as little as a single cell and outperforms a competitors kits that claims similar sensitivity. Total RNA was extracted from a decreasing number of HeLa cells using Norgen's Single Cell RNA Purification Kit and a competitors spin column purification kit. The extracted RNA was subjected to RT-qPCR to detect the human S15 and 5S rRNA transcript in the isolated RNA. RNA isolated by Norgen's Single Cell RNA Purification Kit showed much higher relative expression of each RNA transcript tested at all cell input number down to single cell.



Fatty Tissue RNA Purification Kit

- Isolate high quality total RNA from hard to extract fatty tissues
- Isolate total RNA, including microRNA (miRNA)
- No phenol or chloroform extractions
- Fast and easy processing using rapid spin-column format
- Genomic DNA removal without the use of nucleases

This kit was designed to extract high quality and yield from fatty tissues like brain, breast, adipose tissues, etc. Often Tissues that have high fat contents like brain, breast tissues, etc. can lead to low quality and yield RNA with no-optimized kit.

This kit provides a rapid and optimized method for the isolation and purification of total RNA from animal tissues with high lipid content, including brain and adipose tissues. The kit purifies all sizes of RNA down to microRNA (miRNA) without the use of inhibitory phenol or chloroform. While the kit is optimized for fatty tissues, it can also be used for most mammalian tissue samples.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Size of RNA Purified	All sizes, including < 200 nt
Time to Complete 10 Purifications	50 minutes
Average Yields*	
Brain (15 mg)	15 µg

Ordering Information

Product Name	Cat. No.	Size
Fatty Tissue RNA Purification Kit	36200	25 preps

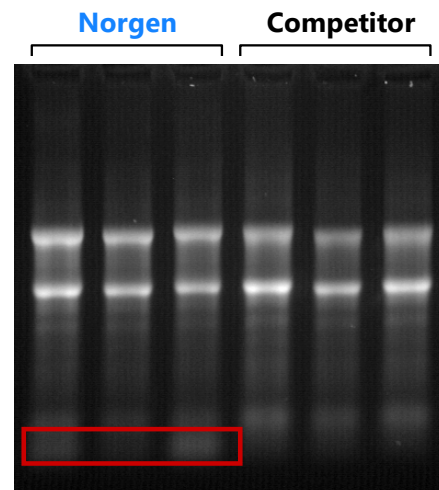


Figure 1. Isolation of High Quality Brain Total RNA including microRNA without the use of Phenol. Norgen's Fatty Tissue RNA Purification Kit isolates high quality total RNA from fatty tissues such as brain without the use of phenol. Total RNA was isolated from equal amounts of brain tissue using Norgen's Fatty Tissue RNA Purification Kit and a leading competitors kit that involves a phenol:chloroform extraction step. The purified RNA was then resolved on a 1.2% formaldehyde-agarose gel. As it can be seen, Norgen not only isolated high and consistent yields of total RNA, but the RNA was also of high quality as evidenced by intactness of the major 28S and 18S rRNA. Importantly, only Norgen's Fatty Tissue RNA Purification Kit was able to recover the small RNA fraction, including the microRNA (red-boxed).

1

RNA Sample Preparation



Isolate RNA, microRNA, DNA and Proteins from the Same Sample

2

RNA Sample Preparation

RNA/DNA/Protein Purification Plus Kit

- Sequentially purify total RNA (and miRNA), DNA and proteins from a single sample
- No sample splitting or need to use phenol or precipitation methods
- Purify RNA/DNA/Protein from cultured animal cells, tissues, blood, bacteria, yeast, fungi or plants
- Rapid and efficient spin column procedure - all done in 30 minutes
- Proteins are purified on column and are soluble in the elution buffer. No further cleaning is required

This kit provides a rapid spin-column method for the isolation and purification of total RNA, genomic DNA and proteins sequentially from a single sample of cultured animal cells, small tissue samples, blood, bacteria, yeast, fungi or plants. The kit employs two columns: 1) for gDNA purification and 2) for RNA purification utilizing silicon carbide columns (superior for the binding of all RNA sizes including miRNA). The proteins are also purified on the second column after RNA elution. The proteins are eluted in buffer and are ready for downstream application without any further clean up required. The proteins can be quantified directly, used in western blots, ELISA or mass spectrometry.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	50 µg for RNA 20 µg for DNA 200 µg for protein
Maximum Column Loading Volume	650 µL
Size of RNA Purified	All sizes, including small RNA (< 200 nt)
Size of DNA Purified	≥ 30 kb

Ordering Information

Product Name	Cat. No.	Size
RNA/DNA/Protein Purification Plus Kit	47700	50 preps

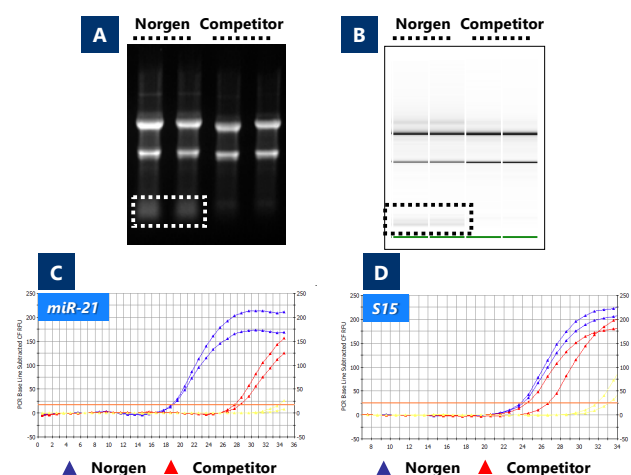


Figure 1. Recovery of True Total RNA including microRNA from HEK-293 Cells. Panel A is a 1X MOPS 1% agarose gel showing the RNA that was isolated from 2 different samples of ~800,000 HEK-293 cells using either Norgen's RNA/DNA/Protein Purification Plus Kit or a competitor's multiple-analyte purification kit. Both kits isolated large RNA (represented by 28S and 18S rRNA) with high integrity but Norgen's RNA/DNA/Protein Purification Plus Kit provided the added benefit of recovering small RNA without any additional protocol. Panel B is a result from a bioanalyzer resolution of the eluted RNA. Similar to the agarose gel, Norgen's RNA/DNA/Protein Purification Plus Kit showed the added benefit of recovering small RNA. The difference in small RNA recovery was also demonstrated by gene-specific RT-qPCR. One microgram of RNA was used in RT-qPCR reactions for human S15 (for Large RNA) and miR-21 (for microRNA) genes. The RNA isolated by Norgen's RNA/DNA/Protein Purification Plus Kit showed similar Ct value to RNA isolated by the competitor's kit for the large RNA (Panel D). However, Norgen's RNA/DNA/Protein Purification Plus Kit showed superior recovery of small RNA including microRNAs as depicted by the miR-21 RT-qPCR (Panel C).



RNA/DNA/Protein Purification Plus Micro Kit

- Sequentially purify RNA (and miRNA), DNA and proteins from a single sample
- Small elution volume down to 20 μ L with a specialized column
- No sample splitting, no need to use phenol or precipitation methods
- Proteins require no further cleaning - ready for Western blot and Mass spectrometry
- Suitable for cells, tissues, stem cells, CTC, small input of samples

This kit is ideal for researchers who are interested in system biology and are studying the genome, proteome and transcriptome of a single sample. Norgen's RNA/DNA/Protein Purification Plus Micro Kit is especially useful for researchers who are isolating macromolecules from precious, difficult to obtain or small samples such as biopsy materials, LCM or single foci from cell cultures, as it eliminates the need to fractionate the sample. Furthermore, analysis will be more reliable since the RNA, DNA and proteins are derived from the same sample, thereby eliminating inconsistent results.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	35 μ g for RNA 10 μ g for DNA 100 μ g for protein
Maximum Column Loading Volume	650 μ L
Size of RNA Purified	All sizes, including small RNA (< 200 nt)
Size of DNA Purified	\geq 30 kb

Ordering Information

Product Name	Cat. No.	Size
RNA/DNA/Protein Purification Plus Micro Kit	51600	50 preps

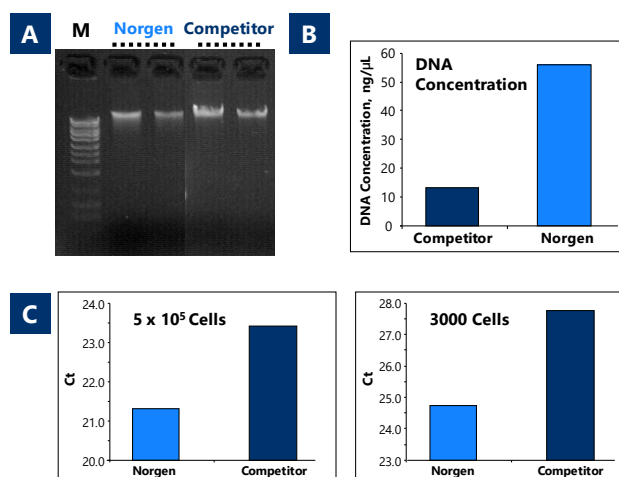


Figure 1. Recovery of Intact, High Quality Genomic DNA from HeLa Cells. Panel A is a 1% agarose gel showing equal amounts of gDNA isolated from the same HeLa cells using Norgens RNA/DNA/Protein Purification Plus Micro Kit or competitors multiple-analyte purification kit. Lane M is Norgen's HighRanger 1 kb DNA Ladder. The gel shows high quality, intact genomic DNA with a better DNA concentration using Norgen's RNA/DNA/Protein Purification Plus Micro Kit (Panel B). Panel C is the result of qPCR amplification of 2 μ L of eluted genomic DNA using 5S rRNA-specific primers. Genomic DNA isolated using Norgens RNA/DNA/Protein Purification Plus Micro Kit is of high quality, and performed better than DNA purified using a competitor's product.

2

RNA Sample Preparation



Isolate RNA, microRNA, DNA and Proteins from the Same Sample

2

RNA Sample Preparation

RNA/DNA/Protein Purification 96-Well Plus Kit

- Consistent, high quality RNA/DNA/Proteins ready for downstream applications
- Sequentially isolate nucleic acids and proteins from a single lysate – no need to split the lysate
- Proteins are eluted ready to use- require no further clean up or purification
- No phenol or chloroform extractions
- Fast and easy processing using vacuum manifold, centrifuge and easily automatable

This 96-well kit provides a rapid method for the high throughput isolation and purification of total RNA, DNA and proteins sequentially from a single sample of cultured animal cells, small tissue samples, blood, bacteria, or yeast. The kit employs two plates: 1) for DNA purification and 2) for RNA purification utilizing silicon carbide resin (superior for the binding of all RNA sizes including miRNA). Please see the protocol schematic below. The proteins are also purified on the second plate after RNA elution. The proteins are eluted in buffer and are ready for downstream applications without any further clean up required. The proteins can be quantified directly, used in western blots, ELISA or mass spectrometry.

Kit Specifications

Specifications	
Binding Capacity Per Well	50 µg for RNA 20 µg for DNA 150 µg for protein
Size of RNA Purified	All sizes, including small RNA (< 200 nt)
Size of DNA Purified	≥ 30 kb
Time to Complete 10 Purifications	35 minutes

Ordering Information

Product Name	Cat. No.	Size
RNA/DNA/Protein Purification 96-Well Plus Kit	51700	1 x 96-well plate

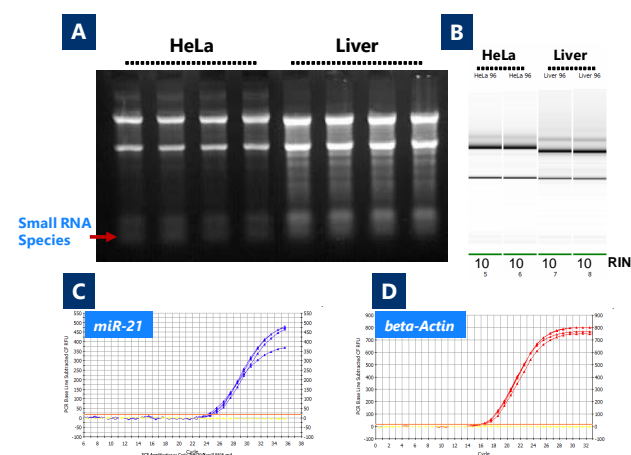


Figure 1. High Throughput Isolation of High Quality RNA with Complete Size Range without the Use of Phenol. Norgen's RNA/DNA/Protein Purification 96-Well Plus Kit allows for the consistent isolation of high quality RNA, with complete size range from the very large RNA down to small RNA without the use of phenol. HeLa RNA and hamster liver RNA was isolated using Norgen's RNA/DNA/Protein Purification 96-Well Plus Kit in replicates. (A) The isolated RNA was resolved on a 1.2% formaldehyde agarose gel. All replicates showed both high yield and high quality. In addition, all replicates showed effective recovery of all sizes of RNA including the small RNA (arrow). (B) The isolated RNA was resolved on an Agilent RNA Nano 6000 Chip. All RNA achieved high RNA Integrity Number (RIN). The RNA isolated by Norgen's RNA/DNA/Protein Purification 96-Well Plus Kit showed good recovery of both small RNA (miR-21, (C)) and large RNA (beta-Actin, (D)).



RNA/DNA Purification Kit

- Sequentially isolate and purify total RNA and DNA from a single sample
- Two column system: one for DNA and one for RNA
- The RNA column is for the purification of total RNA including microRNA
- No need to split the lysate, or to use phenol or precipitation methods

This kit is ideal for researchers who are interested in studying the genome and transcriptome of a single sample, such as for studies of microRNA profiling, gene expression including gene silencing experiments or mRNA knockdowns, studies involving biomarker discovery, and for characterization of cultured cell lines. Norgen's RNA/DNA Purification Kit is especially useful for researchers who are isolating macromolecules from precious, difficult to obtain or small samples such as biopsy materials or single foci from cell cultures, as it eliminates the need to fractionate the sample. Furthermore, analysis will be more reliable since the RNA and DNA are derived from the same sample, thereby eliminating inconsistent results. The purified macromolecules are of the highest purity and can be used in a number of different downstream applications.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	50 µg for RNA 20 µg for DNA
Maximum Column Loading Volume	650 µL
Size of RNA Purified	All sizes, including small RNA (< 200 nt)
Time to Complete 10 Purifications	30 minutes

Ordering Information

Product Name	Cat. No.	Size
RNA/DNA Purification Kit	48700	50 preps

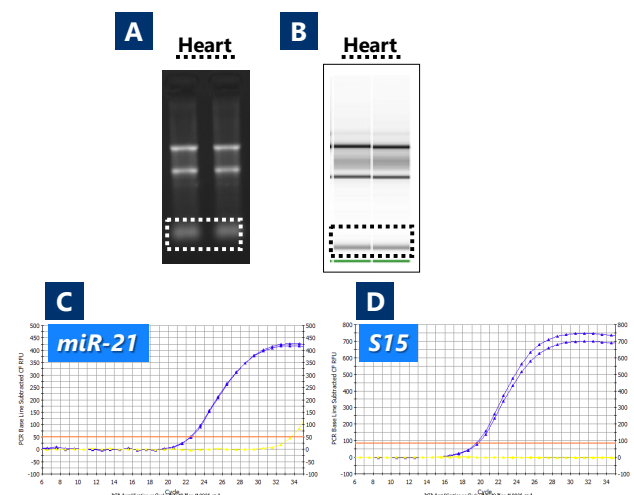


Figure 1. Recovery of True Total RNA including microRNA from Hamster Heart. Panel A is a 1X MOPS 1% agarose gel showing the RNA that was isolated from 2 different samples of 10 mg hamster heart using Norgen's RNA/DNA Purification Kit. Norgen's RNA/DNA Purification Kit isolated large RNA (represented by 28S and 18S rRNA) with high integrity. Moreover, it provided the added benefit of recovering small RNA without any additional protocol. Panel B is a result from a bioanalyzer resolution of the eluted RNA. Similar to the agarose gel, Norgen's RNA/DNA Purification Kit showed the added benefit of recovering small RNA. The effectiveness of small RNA recovery was also demonstrated by gene-specific RT-qPCR. One microgram of RNA was used in RT-qPCR reactions for human S15 (for Large RNA) and miR-21 (for microRNA) genes. The RNA isolated by Norgen's RNA/DNA Purification Kit showed detection of both small RNA (Panel C) and the large RNA (Panel D).

2

RNA Sample Preparation



Isolate RNA, microRNA, DNA and Proteins from the Same Sample

RNA/DNA Purification Micro Kit

2

RNA Sample Preparation

- Sequentially isolate and purify total RNA and DNA from a single sample
- Two specialized small diameter columns: 1) for DNA and 2) for RNA
- The RNA column is for the purification of Total RNA including microRNA
- Ideal for cell number inputs of 500,000 and as little as 5 cells
- Elute DNA or RNA in as little as 20 μ L for clean and concentrated sample
- No need to split the lysate, or to use phenol or precipitation methods

This kit provides a rapid method for the isolation and purification of total RNA and DNA sequentially from a single sample of cultured animal cells of less than 500 tissues, blood, bacteria, yeast, fungi. The lysate is passed over two columns: 1) DNA column and 2) an RNA column. The purified RNA includes all RNA sizes including microRNA. Both DNA and RNA are of the highest purity and yield and are eluted in as little as 20 μ L.

Kit Specifications

Specifications	
Binding Capacity Per Well	35 μ g for RNA 10 μ g for DNA
Size of RNA Purified	All sizes, including small RNA (<200 nt)
Average Yields*	
HeLa Cells (5 x 10 ⁵ cells)	RNA: 10-12 μ g
HeLa Cells (5 x 10 ⁵ cells)	DNA: 1-2 μ g
Time to Complete 10 Purifications	30 minutes

Ordering Information

Product Name	Cat. No.	Size
RNA/DNA Purification Micro Kit	50300	50 preps

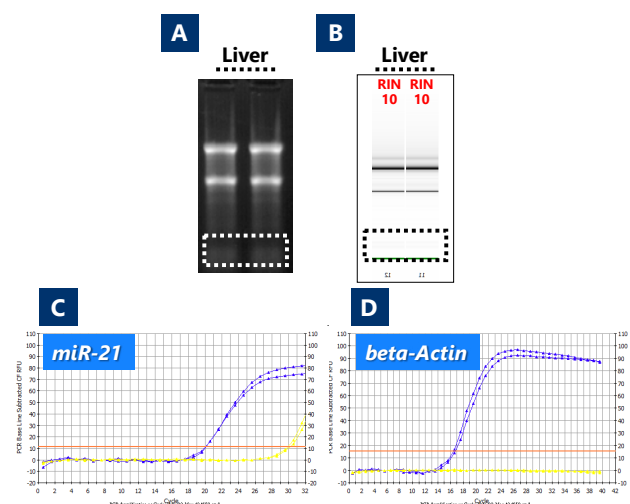


Figure 1. Recovery of True Total RNA including microRNA from Hamster Liver. Panel A is a 1X MOPS 1% agarose gel showing 3 μ L of 20 μ L eluted RNA that was isolated from 2 different samples of 5 mg hamster liver using Norgen's RNA/DNA Purification Micro Kit. Norgen's RNA/DNA Purification Micro Kit isolated large RNA (represented by 28S and 18S rRNA) with high integrity. Moreover, it provided the added benefit of recovering small RNA without any additional protocol. Panel B is a result from a bioanalyzer resolution of the eluted RNA. Similar to the agarose gel, Norgen's RNA/DNA Purification Micro Kit showed the added benefit of recovering small RNA while isolating very high quality RNA. The effectiveness in small RNA recovery was also demonstrated by gene-specific RT-qPCR. One microgram of RNA was used in RT-qPCR reactions for beta-Actin (for Large RNA) and miR-21 (for microRNA) genes. The RNA isolated by Norgen's RNA/DNA Purification Micro Kit showed detection of both small RNA (Panel C) and the large RNA (Panel D).



RNA/Protein Purification Plus Kit

- Sequentially purify total RNA and total proteins from a single sample
- Kit includes a gDNA elimination column
- No sample splitting required
- No phenol step required for efficient isolation
- Ideal for small or difficult to obtain samples
- Purify RNA and proteins from cultured animal cells, tissues, blood, bacteria, yeast, fungi or plants
- Rapid and efficient spin column procedure

This kit provides a rapid, single column method for the isolation and purification of total RNA (including miRNA) and proteins sequentially from a single sample of cultured animal cells, tissues, blood, bacteria, yeast, fungi or plants. The total RNA and proteins are both column purified in under 25 minutes using a single column. Purified RNA is of a high quality and yield, and is suitable for NGS, RT-qPCR and microarrays.

This kit eliminates DNA efficiently using a gDNA removal column. Proteins are eluted in buffer and are ready for downstream applications such as Western Blots, Mass Spec and some ELISA applications. The proteins will not require precipitation, resuspending of pellets, or any further cleaning.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	50 µg for RNA 200 µg for Protein
Maximum Column Loading Volume	650 µL
Size of RNA Purified	All sizes
Time to Complete 10 Purifications	30 minutes

Ordering Information

Product Name	Cat. No.	Size
RNA/Protein Purification Plus Kit	48200	50 preps

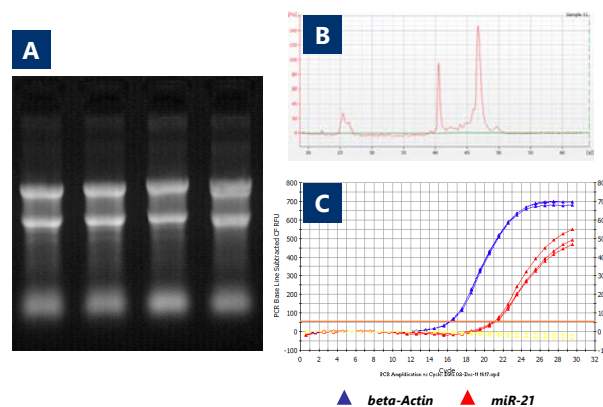


Figure 1. Recovery of True Total RNA including microRNA from Hamster Liver. Panel A is a 1X MOPS 1% agarose gel showing the RNA that was isolated from 2 different samples of 10 mg hamster liver using Norgen's RNA/Protein Purification Plus Kit. Norgen's RNA/Protein Purification Plus Kit isolated both large RNA (represented by 28S and 18S rRNA) as well as small RNA with high integrity and without having to perform any additional protocol. Panel B is a result from a bioanalyzer resolution of the eluted RNA. Similar to the agarose gel, the Bioanalyzer showed that Norgen's RNA/Protein Purification Plus Kit has the added benefit of recovering small RNA. One microgram of the RNA was used in RT-qPCR reactions for the detection of human beta-Actin (for Large RNA) and miR-21 (for microRNA) genes. The RNA isolated using Norgen's RNA/Protein Purification Plus Kit showed superior recovery of both large RNA and small RNA including microRNAs as depicted by the successful miR-21 RT-qPCR (Panel C).

2

RNA Sample Preparation



Plant/Fungi Total RNA Purification Kit

- 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

Norgen's Plant/Fungi Total RNA Purification Kit provides a rapid method for the isolation and purification of total RNA, including virus and viroid RNA, from a wide range of plants. Total RNA can be purified from fresh or frozen plant tissues, plant cells or filamentous fungi samples using this kit. All sizes of RNA are purified, including microRNA (miRNA). The procedure is rapid and convenient.

Kit Specifications

Specifications	
Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Size of RNA Purified	All sizes, including small RNA (<200 nt)
Maximum Amount of Starting Material:	
Plant Tissues	50 mg
Plant Cells	1 x 10 ⁶ cells
Fungi	50 mg (wet weight)
Time to Complete 10 Purifications	20 minutes

Ordering Information

Product Name	Cat. No.	Size
Plant/Fungi Total RNA Purification Kit	25800	50 preps
Plant/Fungi Total RNA Purification Kit	31350	100 preps
Plant/Fungi Total RNA Purification Kit	25850	250 preps
Plant/Fungi Total RNA Purification 96-Well Kit	31900	2 x 96-well plates

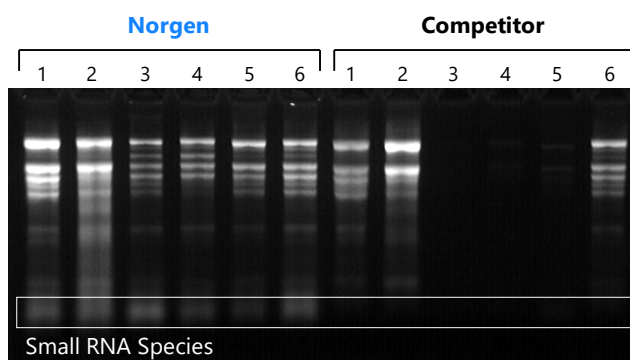


Figure 1. Isolation of High Quality RNA, even from Difficult Samples. Total RNA was isolated from 50 mg samples of apple (Lanes 1), peach (Lanes 2), grape (Lanes 3), pine needle (Lanes 4), strawberry (Lanes 5) and pear (Lanes 6) using Norgen's kit and a competitor's kit. Five microlitres of total RNA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

- Fast and easy processing using a rapid spin-column format
- No phenol or chloroform extractions
- Isolate all small RNA molecules (<200 nt)
- Minimal contamination from large RNA molecules and genomic DNA
- High quality small RNA can be used in various downstream applications

Norgen's Plant microRNA Purification Kit provides a rapid method for the isolation and purification of small RNA molecules (< 200 nt) from cultured plant cells or plant tissues. These small RNAs include regulatory RNA molecules such as microRNA (miRNA) and short interfering RNA (siRNA), as well as tRNA and 5S rRNA. Small RNA molecules are often studied due to their ability to regulate gene expression. miRNAs and siRNAs are typically 20-25 nucleotides long, and regulate gene expression by binding to mRNA molecules and affecting their stability or translation. The small RNA molecules isolated using Norgen's Plant microRNA Purification Kit can be used in various downstream applications relating to gene regulation and functional analysis, including RT-PCR, miRNA sequencing, northern blotting and microarray analysis.

Kit Specifications

Specifications	
Column Binding Capacity	45 µg
Size of RNA Purified	All sizes, including small RNA (<200 nt)
Maximum Amount of starting Material	45 µg of RNA
Minimum Elution Volume	8 µL
Time to Complete 10 Purifications	20 minutes

Ordering Information

Product Name	Cat. No.	Size
Plant microRNA Purification Kit	54700	25 preps

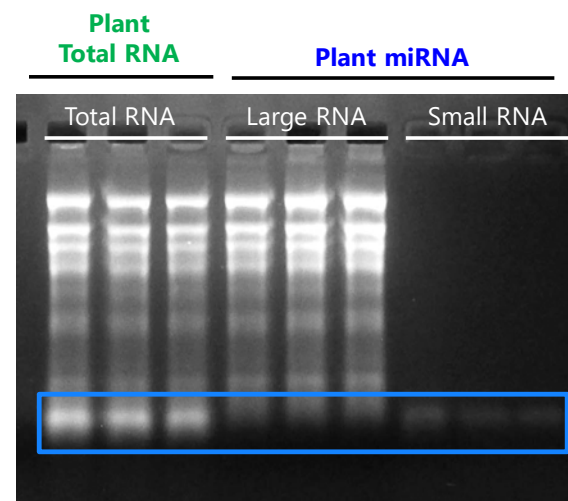


Figure 1. Fractionation of Large and Small RNA. Large RNA and small RNA were sequentially purified using Norgen's Plant miRNA Purification Kit from 50 mg of raspberry leaf tissue and the RNA profile was compared with the RNA isolated using Norgen's Plant/Fungi Total RNA Purification Kit (Cat. #25800). 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.

3

RNA Sample Preparation



Plant RNA/DNA Purification Kit

- Robust Lysis Solution processes even the most challenging plant species such as pine needle and grape
- No phenol extractions
- DNA and all sizes of RNA are recovered, including microRNA
- High quality DNA and RNA are purified simultaneously using the same spin column
- No need to split the lysate

This kit provides for rapid spin column isolation and purification of total RNA and genomic DNA simultaneously from a single plant sample without splitting the lysate. Norgen's plant lysis solution is highly robust and effective over a wide range of plants including challenging samples. The total RNA and genomic DNA are both column purified in under 30 minutes. Since RNA and DNA are isolated without splitting the lysate, variability and inconsistent results are reduced. All sizes of RNA including microRNA are recovered without the need for phenol. Isolated nucleic acids are of a high quality and yield, and are ready for downstream use including PCR, qPCR, RT-PCR, qRT-PCR, sequencing and more.

Kit Specifications

Specifications	
Column Binding Capacity	50 µg for RNA 15 µg for gDNA
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 x 10 ⁶
Time to Complete 10 Purifications	30 minutes

Ordering Information

Product Name	Cat. No.	Size
Plant RNA/DNA Purification Kit	24400	50 preps

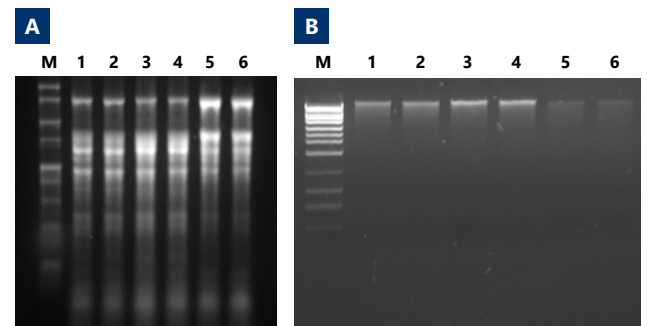


Figure 1. Isolation of Total RNA and Genomic DNA from Tobacco, Tomato and Peach Leaf Tissue. Total RNA and genomic DNA were isolated from 50 mg of tobacco leaf, 50 mg of tomato leaf and 50 mg of peach leaf using Norgen's Plant RNA/DNA Purification Kit. Panel A is a 1X MOPS 1.5% agarose gel showing the total RNA that was isolated after the optional on-column DNase digestion. Five 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.



Soil Total RNA Purification Kit

- Isolate high quality total RNA from a variety of soil samples
- Process all types of soil, including common soil, compost and manure
- Remove all traces of humic acids and other inhibitors of PCR
- Isolates all sizes of RNA, including microRNA, without phenol
- Complete kit including bead tubes and humic acid removal columns (HAR)

This kit provides a convenient and rapid spin column method to purify total RNA from small amounts of soil samples. All types of soil samples can be processed with this kit, including common soil samples and difficult soil samples with high humic acid content such as compost and manure. The kit removes all traces of humic acids and other inhibitors of PCR using humic acid removal (HAR) columns and the organic substance removal solution (OSR).

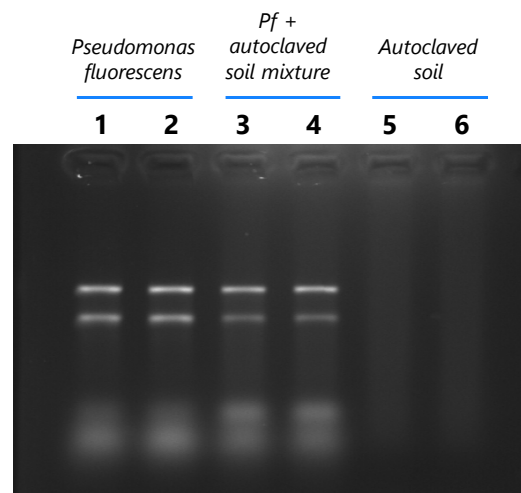


Figure 1. Isolation of Total RNA from Bacteria in Soil. *Pseudomonas fluorescens* was spiked into 250 mg samples of autoclaved soil and total RNA was isolated using Norgen's Soil Total RNA Purification Kit. RNA was visualized by running 7.5 μ L of each 75 μ L elution on a 1.2% agarose-formaldehyde RNA 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).

Kit Specifications

Specifications	
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 μ g
Maximum Column Loading Volume	650 μ L
Time to Complete 10 Purifications	30 minutes

Ordering Information

Product Name	Cat. No.	Size
Soil RNA Purification Kit	27750	50 preps



Water RNA/DNA Purification Kit

- Isolate total DNA and RNA from all microorganisms found in water, including bacteria, fungi and algae
- RNA and DNA are both column purified simultaneously using the same column
- Elution contains concentrated DNA and RNA without the need for further precipitation
- Complete RNA (including microRNA) without phenol
- Isolated RNA and DNA are of high quality and integrity for all downstream applications

This kit provides a convenient and rapid method for the isolation of microorganisms from water samples. The kit allows for the rapid isolation and purification of total RNA and DNA simultaneously from the microorganisms found in different types of water samples. The total RNA and DNA (including genomic DNA) are isolated from all the microorganisms found in the water, including bacteria, fungi and algae without the use of any inhibitory organic substances. The kit purifies genomic DNA, and all sizes of RNA, from large mRNA and ribosomal RNA down to microRNA (miRNA) and small interfering RNA (siRNA). The purified RNA and DNA are highly concentrated, and can be used directly in a number of downstream applications.

Kit Specifications

Specifications	
Maximum Spin Column Loading Volume	650 μ L
Elution Volume	100 μ L
Time to Complete 10 Purifications	45 minutes

Ordering Information

Product Name	Cat. No.	Size
Water RNA/DNA Purification Kit (without filters)	26480	50 preps
Water RNA/DNA Purification Kit - 0.45 μ m (with filters)	26450	25 preps
Water RNA/DNA Purification Kit - 0.22 μ m (with filters)	26400	25 preps

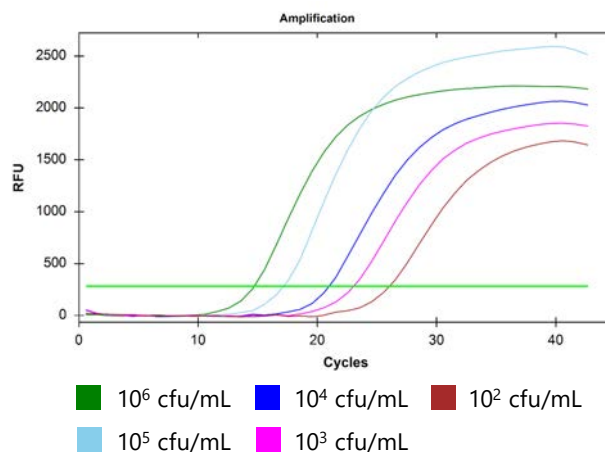


Figure 1. Detection of *E. coli* 16S rDNA by Real-Time PCR (SYBR Green)
Fifty mL water samples spiked with increasing amounts of *E. coli* were filtrated through 0.45 μ m water filter columns, and RNase-treated DNA was isolated from the filter by following Norgen's Water RNA/DNA Purification Kit manual. Next, 2 μ L of DNA from the 50 μ L elutions was mixed in 18 μ L of total real-time PCR reaction master mix and real-time PCR was performed (95°C for 3 minutes and 40 cycles at 95°C for 15 second and 60°C for 30 seconds). All tested water samples containing different *E. coli* amounts were found to correspond to the real-time PCR results. *E. coli* was specifically detected by *E. coli* 16S rDNA primers down to 10² cfu/mL, indicating the quality of DNA and the efficiency of filtering system.



RNA Clean-Up and Concentration Kit

- Clean-up & concentrate total RNA (including miRNA) in minutes
- Clean-up & concentrate RNA from TRIzol®, TRI Reagent®, etc
- Clean-up RNA from contaminants including enzymes, primers, nucleotides
- Rapid spin-column protocol, elute in 20 µL
- 96-well format for high throughput processing & small spin column formats for 8 µL are available
- Purified RNA is fully compatible with all downstream applications

This kit is designed to clean-up and concentrate RNA (including miRNA) from TRIzol® and TRI Reagent®, enzymatic reactions, in vitro transcription, labelling reactions, etc. This is a robust kit for all clean-up and concentration purposes for up to 35 µg of RNA in solution. The purified RNA is of the highest purity and integrity, and can be used in a number of downstream applications.

Kit Specifications

Specifications	
Maximum Column Binding Capacity	35 µg
Size of RNA Purified	All sizes, including small RNA (<200 nt)
Maximum Amount of starting Material	35 µg of RNA
Minimum Elution Volume	20 µL
Time to Complete 10 Purifications	20 minutes
Average Recovery	≥ 90%

Ordering Information

Product Name	Cat. No.	Size
RNA Clean-Up and Concentration Kit	23600	50 preps
RNA Clean-Up and Concentration Kit	43200	100 preps
RNA Clean-Up and Concentration Kit	25100	2 x 96-well plates

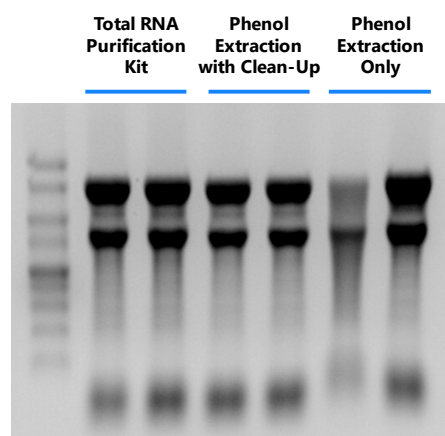


Figure 1. Effective Clean-Up to Produce High Quality Total RNA with Complete Size Diversity. Norgen's RNA Clean-Up and Concentration Kit effectively cleans up RNA isolated from phenol-based extractions without the loss of RNA diversity by retaining all RNA species including small RNAs. Total RNA was isolated from 5×10^8 E. coli using a competitor's phenol-based RNA extraction reagent. The resulting RNA was then purified using Norgens RNA Clean-Up and Concentration Kit. As controls, total RNA was extracted using both Norgen's Total RNA Purification Kit (#17200, no phenol required) and the phenol-based RNA extraction reagent only without any clean-up. Resolution of 7 µL of the 50 µL purified RNA on a 1X MOPS, 1.5% formaldehyde-agarose gel showed the RNA extracted with phenol was successfully cleaned-up by Norgen's RNA Clean-Up and Concentration Kit without the loss of small RNA species.

4

RNA Sample Preparation



RNA Clean-Up and Concentration Micro-Elute Kit

- Concentration of small amounts of RNA into 8 μ L
- Ideal for concentrating RNA samples prior to NGS library preparation
- Ideal for concentrating RNA purified from exosomes, plasma, serum, urine, and other bodily fluids, and any RNA samples initially purified in large volumes
- Efficient RNA cleanup from enzymatic reactions – labeling, DNase treatment and in vitro transcription

This kit provides a rapid method for the purification, cleanup and concentration of RNA for NGS Library preparation and excellent processing of up to 45 μ g of RNA isolated using different methods including phenol/guanidine-based protocols, and from various upstream enzymatic reactions such as DNase treatment, labeling and in vitro transcription. The minimum recommended elution volume is 8 μ L, which enables the concentration of small amounts of all sizes of RNA, from large mRNA and ribosomal RNA down to microRNA (miRNA) and small interfering RNA (siRNA). The RNA is preferentially purified from other reaction components such as proteins, RNases and nucleotides, without the use of phenol or chloroform.

Kit Specifications

Specifications	
Column Binding Capacity	45 μ g
Size of RNA Purified	All sizes, including small RNA (<200 nt)
Maximum Amount of starting Material	45 μ g of RNA
Minimum Elution Volume	8 μ L
Time to Complete 10 Purifications	20 minutes

Ordering Information

Product Name	Cat. No.	Size
RNA Clean-Up and Concentration Micro-Elute Kit	61000	50 preps

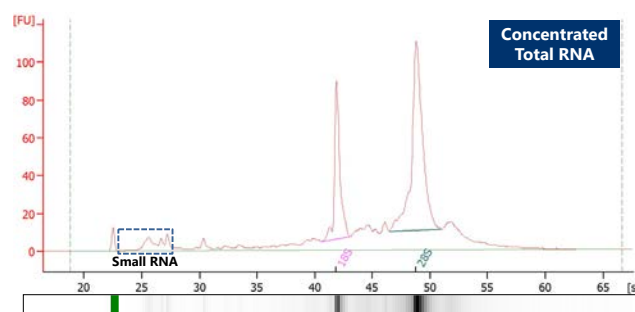


Figure 1. Excellent Quality of Concentrated RNA. Total RNA isolated from HeLa cells (2 μ g) was concentrated to 8 μ L using the RNA Clean-Up and Concentration Micro-Elute Kit. The excellent quality is indicated by the electropherogram generated using the Agilent 2100 Bioanalyzer (RIN > 9). The concentrated RNA is a true 'total RNA' as can be observed by the presence of small RNA species.



CleanAll DNA/RNA Clean-Up and Concentration Micro Kit

- Can be used for the clean up of both RNA and DNA from enzymatic reactions, labeling etc.
- Purifies all sizes of RNA, from large mRNA down to microRNA (miRNA)
- Purifies all sizes of DNA, from small PCR products to plasmids to genomic DNA
- Removes endotoxins for transfection of injection ready RNA or DNA
- Rapid and efficient spin-column format (20 minutes)

Norgen's CleanAll DNA/RNA Clean-Up and Concentration Micro Kit provides a rapid method for the purification, cleanup and concentration of RNA or DNA from different isolation methods or upstream applications. The kit can be used as an alternative to organic extraction and ethanol precipitation to clean up various enzymatic reactions.

Kit Specifications

Specifications	
Maximum Amount of Starting Material	50 µg RNA 10 µg DNA
Maximum Column Loading Volume	600 µL
Minimum Elution Volume	20 µg
Time to Complete 10 Purifications	20 minutes
Average Recovery	≥90% for RNA ≥90% for DNA 100 bp - 10 kbp ≥75% for DNA ≥ 10 kbp

Ordering Information

Product Name	Cat. No.	Size
CleanAll DNA/RNA Clean-Up and Concentration Micro Kit	23800	50 preps

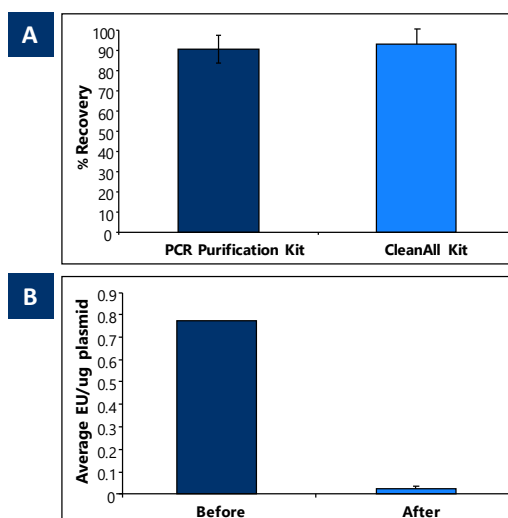


Figure 1. High Recoveries and Efficient Endotoxin Removal. High recoveries of DNA can be seen when using the CleanAll kit, and these high recoveries are not compromised even during endotoxin removal. In Panel A, 1 µg of a PCR product was cleaned using the CleanAll DNA/RNA Clean-Up and Concentration Micro Kit as well as Norgen's PCR Purification Kit. More than 0.9 µg of the DNA was recovered from both kits with a comparable percent recovery of over 90%. In Panel B, 10 µg of plasmid DNA preparation was cleaned from endotoxin by using the CleanAll DNA/RNA Kit. Endotoxin levels of the plasmid DNA sample were reduced from 0.75 EU/µg plasmid DNA to less 0.05 EU/µg plasmid DNA. Approximately 95% of the endotoxin units in the DNA sample were removed using the kit, therefore the kit allows for high recoveries coupled with exceptional cleanup.

4

RNA Sample Preparation



Oligo Clean-Up and Concentration Kit

- Cleans and concentrates single-stranded or double-stranded DNA or RNA oligonucleotides larger than 10 bases
- Rapid and efficient spin column procedure
- No phenol, chloroform or alcohol precipitations are involved
- High recovery of up to 90%
- Efficient removal of enzymatic reaction buffers and proteins

This kit provides a rapid spin column procedure for the purification and concentration of up to 10 µg of oligonucleotides of various sizes. The kit is used for the purification of synthesized oligos, as well as the clean-up of oligos from various upstream enzymatic reactions such as ligation, Poly(A) tailing and end-labeling.

Single or double stranded DNA or RNA oligos larger than 10 bp can be purified with this kit (not recommended for the removal of PCR primers). Oligos of up to 1000 bp have been tested with this kit.

Kit Specifications

Specifications	
Column Binding Capacity	10 µg
Maximum Column Loading Volume	600 µL
Size of DNA/RNA Purified	> 10 nt, single stranded or double stranded
Minimum Elution Volume	20 µL
Time to Complete 10 Purifications	15 minutes

Ordering Information

Product Name	Cat. No.	Size
Oligo Clean-Up and Concentration Kit	34100	50 preps

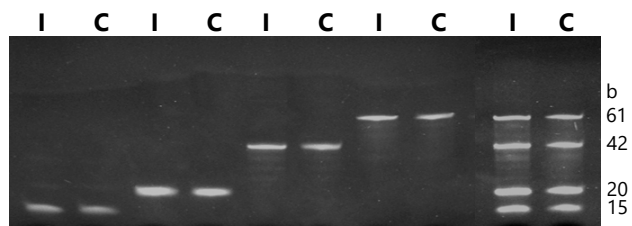


Figure 1. Integrity of Purified DNA Oligonucleotides. Oligonucleotides of different sizes (15mer, 20mer, 42mer and 61mer) were purified using Norgen's Oligo Clean-Up and Concentration Kit, and the integrity of the oligonucleotides before and after cleaning were compared by running a 15% urea-PAGE gel. Equal volumes of the input (I) and cleaned (C) oligonucleotide were run, and as it can be seen the purified oligonucleotides were of a high quality and integrity. Please note that the kit can also clean a mixture of different oligo sizes, as shown on the far right two lanes.



FFPE RNA Purification Kit

- Extract total RNA (including microRNA) from FFPE samples
- No phenol extraction step
- Includes DNase for optional on-column DNA removal
- Isolated RNA is of the highest quality and integrity

Norgen’s FFPE RNA Purification Kit provides a rapid method for the isolation and purification of total RNA (including microRNA) from formalin-fixed paraffin-embedded (FFPE) tissue samples in as little as 1 hour. Using formalin to fix tissues leads to crosslinking of the RNA and proteins, and the process of embedding the tissue samples can also lead to fragmentation of the RNA over time. Norgen’s FFPE RNA Purification Kit provides conditions that allow for the partial reversing of the formalin modifications, resulting in a high quality and yield of RNA. The kit is able to purify all sizes of RNA, from large mRNA and ribosomal RNA down to microRNA (miRNA) and small interfering RNA (siRNA), depending on the age of the FFPE tissue as fragmentation of the RNA is known to occur over time.

Kit Specifications

Specifications	
Binding Capacity Per Column	Up to 50 µg RNA
Maximum Loading Volume Per Spin Column	650 µL
Size of RNA Purified	All sizes, including microRNA (<200 nt)
Maximum Amount of Starting Material	5 slices of 20 µm thick paraffin slices, 25 mg of unsectioned block

Ordering Information

Product Name	Cat. No.	Size
FFPE RNA Purification Kit	25300	50 preps

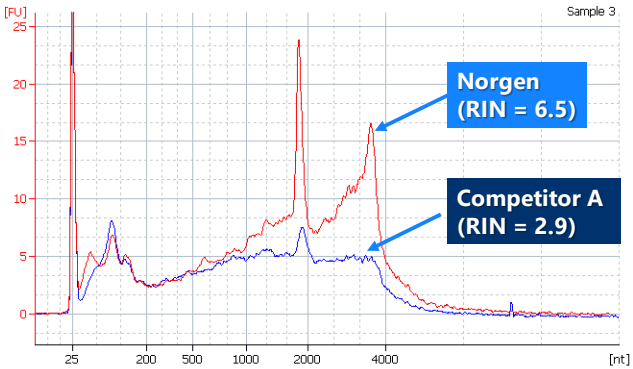


Figure 1. High Quality and Yield of Total RNA. Norgen’s FFPE RNA Purification Kit isolates FFPE RNA that exceeds both yield and quality of competitors. Total RNA was isolated from one slice of hamster FFPE kidney section (20 micron thickness) using Norgen’s FFPE RNA Purification Kit and a leading competitors kit. One microliter of the 50 µL purified RNA was then resolved on an Agilent 2100 BioAnalyzer using an RNA Nano 6000 chip. As it can be seen, Norgen not only isolated higher yields of total RNA, but the RNA was also of a higher quality as evidenced by the higher RIN values obtained with Norgen’s RNA.



FFPE RNA/DNA Purification Plus Kit

- Fast and easy processing using rapid spin-column format
- High yields and quality of nucleic acids
- Separate fractionation of RNA and DNA
- Isolate total RNA, from large rRNA down to microRNA (miRNA)
- No phenol or chloroform extractions

Norgen's FFPE RNA/DNA Purification Plus Kit provides a rapid method for the sequential isolation and purification of total RNA (including microRNA) and genomic DNA from formalin-fixed paraffin-embedded (FFPE) tissue samples. The RNA and DNA are sequentially purified into separate fractions using this kit. Using formalin to fix tissues leads to crosslinking of the nucleic acids and proteins, and the process of embedding the tissue samples can also lead to fragmentation of the nucleic acids over time. Norgen's FFPE RNA/DNA Purification Plus Kit provides conditions that allow for the partial reversing of the formalin modifications, resulting in a high quality and yield of nucleic acids

Kit Specifications

Specifications	
Binding Capacity Per Column	RNA: Up to 35 µg DNA: Up to 10 µg
Loading Volume Per Spin Column	600 µL
Size of RNA Purified	All sizes, including < 200 nt
Maximum Amount of Starting Material	4 sections <20 µM thick 10 mg of unsectioned block

Ordering Information

Product Name	Cat. No.	Size
FFPE RNA/DNA Purification Plus Kit	54300	50 preps

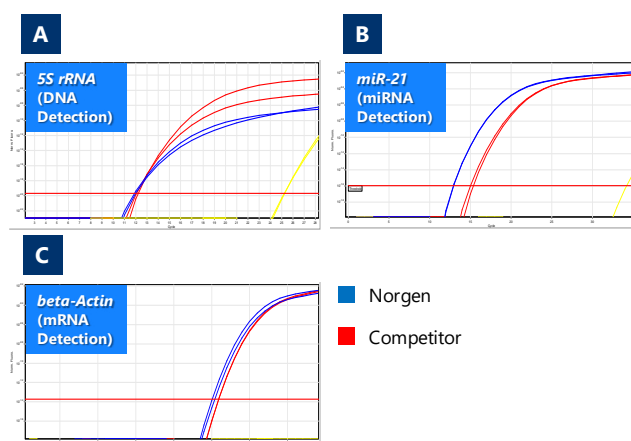


Figure 1. Recovery of High Quality DNA and True Total RNA including microRNA from Hamster Spleen. Genomic DNA isolated using Norgen's FFPE RNA/DNA Purification Plus Kit is of high quality with effective qPCR amplification. Panel A showed that in a qPCR using primers against the 5S rRNA gene using equal amount of FFPE DNA as template, the DNA isolated with Norgen's kit showed better amplification (lower Ct value). Moreover, Norgen's FFPE RNA/DNA Purification Plus Kit isolates true total RNA including microRNA. With the same amount of RNA as template in RT-qPCR reactions for transcripts of miR-21 (Panel B for microRNA) and beta-Actin (Panel C for mRNA), RNA isolated by Norgen showed better amplification in beta-Actin and significantly better in miR-21 microRNA.



FFPE RNA Purification 96-Well Kit

- Extract total RNA (including microRNA) from FFPE samples
- No phenol extraction step
- Includes DNase for optional on-plate DNA removal
- Isolated RNA is of the highest quality and integrity
- Process using either a vacuum manifold or centrifugation

Using formalin to fix tissues leads to cross linking of the RNA and proteins, and the process of embedding the tissue samples can also lead to fragmentation of the RNA over time. Norgen's FFPE RNA Purification 96-Well Kit provides conditions that allow for the partial reversing of the formalin modifications, resulting in a high quality and yield of RNA. The kit is able to purify all sizes of RNA, from large mRNA and ribosomal RNA down to microRNA (miRNA) and small interfering RNA (siRNA), depending on the age of the FFPE tissue as the degree of fragmentation of the RNA will increase over time. The RNA is preferentially purified from other cellular components without the use of phenol or chloroform. Purification can be performed using either a vacuum manifold or centrifugation.

Kit Specifications

Specifications	
Binding Capacity Per Well	50 µg
Maximum Loading Volume Per Well	500 µL
Size of RNA Purified	All sizes
Maximum Amount of Starting Material:	
Paraffin Slices	5 slices 20 µm thick
Unsectioned Block	25 mg

Ordering Information

Product Name	Cat. No.	Size
FFPE RNA Purification 96-Well Kit	25400	2 x 96-well plates

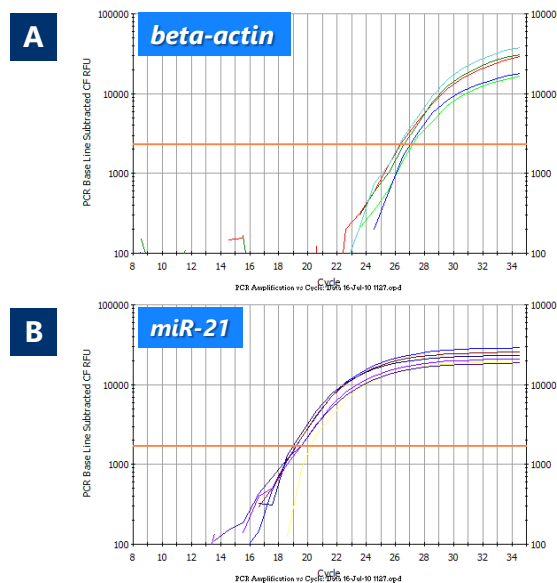
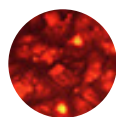


Figure 1. High Yield and Consistent Recovery of a Diversity of RNA Species. Norgen's FFPE RNA Purification 96-Well Kit effectively recovers all sizes of RNA including large mRNA to small RNA including microRNAs. Total RNA was isolated from two equal amounts of an FFPE tissue sample using Norgens FFPE RNA Purification Kit. The purified RNA was then used as the template in a RT-qPCR for detecting the beta-actin gene (Panel A) and for detecting miR-21 (Panel B). As it can be seen, Norgen's kit successfully and consistently isolated not only large RNA (Panel A) but also microRNA (Panel B), indicating the diversity of RNA species isolated.

5

RNA Sample Preparation



Cytoplasmic and Nuclear RNA Purification Kit

- Excellent separation and purification of cytoplasmic and nuclear RNA
- Convenient and fast spin column format
- High quality and yield of RNA
- Isolate full diversity of RNA (including microRNA) without phenol
- Purified RNA is ready for any application including RT-PCR, qRT-PCR, RNA-Seq, arrays and more
- Cytoplasmic RNA is free of DNA and ready for direct use in RT-PCR/qRT-PCR

This kit provides a rapid method for the isolation and purification of both cytoplasmic and nuclear RNA from cultured animal cells and small tissue samples. The kit can be used to isolate all sizes of RNA from the cytoplasmic and nuclear RNA fractions, including all small RNA species without any requirement for phenol. Included in the kit are sufficient reagents to perform either 50 cytoplasmic RNA preparations or 25 cytoplasmic and 25 nuclear RNA preparations. Ten samples can be processed in approximately 45 minutes. This kit is also available in a 100 prep size.

Kit Specifications

Specifications	
Binding Capacity Per Column	Up to 50 µg RNA
Loading Volume Per Spin Column	650 µL
Size of RNA Purified	All sizes, including < 200 nt
Time to Complete 10 Purifications	45 minutes
RNA Yield	
HeLa (1 x 10 ⁶) - Cytoplasmic RNA	15 µg
HeLa (1 x 10 ⁶) - Nuclear RNA	≤ 3.5 µg

Ordering Information

Product Name	Cat. No.	Size
Cytoplasmic and Nuclear RNA Purification Kit	21000	50 preps
Cytoplasmic and Nuclear RNA Purification Kit	37400	100 preps

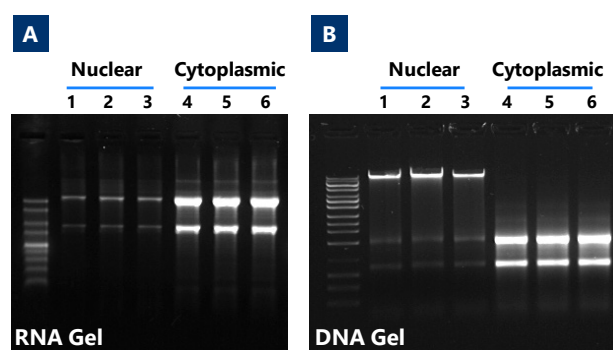


Figure 1. Effective Separation of HeLa Cell Cytoplasmic & Nuclear RNA. Norgen's Cytoplasmic & Nuclear RNA Purification Kit was used to effectively separate cytoplasmic and nuclear RNA from 0.75 million HeLa cells in triplicate. Panel A: High quality cytoplasmic and nuclear RNA was purified using Norgen's kit. Note the integrity and quality of both cytoplasmic and nuclear RNA. Ten microliters of each 50 µL elution were run on a 1.5% formaldehyde-agarose gel. Lane M is Norgen's 1 kb RNA Ladder, lanes 1-3 contain nuclear RNA and lanes 4-6 contain cytoplasmic RNA. Panel B: Ten microliters of the above cytoplasmic and nuclear RNA isolated from HeLa cells using Norgen's kit was run on a 0.9% agarose DNA gel. Genomic DNA is clearly visible in the nuclear RNA fractions (lanes 1-3), however, no genomic DNA can be detected in the cytoplasmic RNA fractions (lanes 4-6). Note that an optional on-column DNase treatment protocol is provided to remove the genomic DNA in the nuclear fraction.



Stool Total RNA Purification Kit

- Simultaneous isolation of both host RNA and microbial RNA (universal protocol)
- Isolate full diversity of RNA from large RNA down to small and microRNAs
- Eliminates PCR inhibitors including humic acids
- High quality RNA for sensitive downstream applications

This kit provides a convenient and rapid method to purify total RNA from small amounts of stool samples. All types of stool samples can be processed with this kit, including animal fecal samples, manure and samples collected using Norgen's Stool Nucleic Acid Collection and Transport Tubes (Cat. 45660). The kit removes all traces of humic acids using rapid and simple spin column procedures. Bead tubes are also provided for effective homogenization of stool. The kit purifies all sizes of RNA, from large mRNA and ribosomal RNA down to microRNA and small interfering RNA. Both host and microbial RNA is recovered. The purified RNA is of the highest integrity, and can be used in a number of downstream applications including real time PCR and reverse transcription PCR for gene expression analysis. The procedure can be completed in approximately 30 minutes.

Kit Specifications

Specifications	
Maximum Stool Input	200 mg
Type of Stool Processed	Frozen, fresh or preserved stool
Maximum Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Time to Complete 10 Purifications	30 minutes

Ordering Information

Product Name	Cat. No.	Size
Stool Total RNA Purification Kit	49500	50 preps

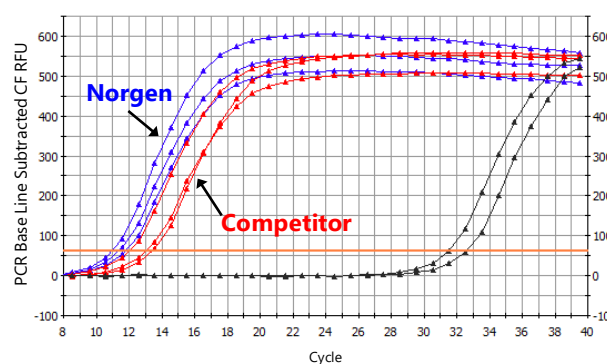
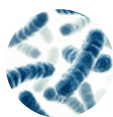


Figure 1. Detection of Bacterial Stool RNA using 16S Primers. Total stool RNA was isolated from 200 mg human stool samples using Norgen's Stool RNA Purification Kit and a leading competitors kit. Five microliters of purified RNA was used in a 20 µL reverse-transcription reaction using Invitrogen's Superscript III system with 16S reverse primers. The cDNA generated was then used in a qPCR reaction involving Norgen's 2X PCR Mastermix spiked with SYBR green (Bio-Rad), using 0.3µM of primers against bacterial 16S. As can be seen in the amplification plot, Norgen's kit outperformed the leading competitor's kit by on average 1.5 Ct values. This indicates that Norgen isolated higher quality and yields of RNA from stool, that can be used in an array of downstream applications.

7

RNA Sample Preparation



Stool Nucleic Acid Isolation Kit

- Simultaneous isolation of both host and microbial DNA and RNA
- Eliminates PCR inhibitors including humic acids
- High quality total RNA and DNA for sensitive downstream applications

This kit provides a rapid spin column method to isolate total DNA and RNA from fresh or frozen stool samples, as well as from stool collected using Norgen's Stool Nucleic Acid Collection and Transport Tubes. The universal protocol conveniently allows for the isolation of total genomic DNA and total RNA from all the various microorganisms and host cells found in the stool sample simultaneously. The kit removes all traces of humic acids and provides consistent, high yields of RNA and DNA.

Kit Specifications

Specifications	
Maximum Stool Input	200 mg
Type of Stool Processed	Frozen, fresh or preserved stool
Maximum Column Binding Capacity	50 µg
Maximum Column Loading Volume	650 µL
Time to Complete 10 Purifications	30 minutes

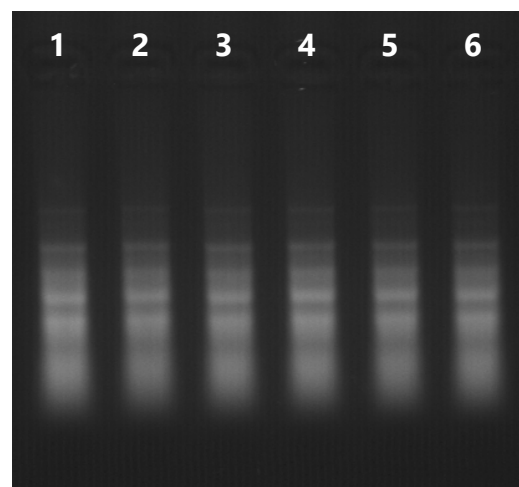


Figure 1. Total RNA Profile from Different Stool Samples. Total RNA and DNA were isolated from 6 different 200 mg human stool samples using Norgen's Stool Nucleic Acid Isolation Kit. For analysis, 7.5 µL from each 75 µL elution were loaded on 1.2 % MOPS agarose gel. All six sample showed a good RNA integrity and total RNA profile that includes large and small RNA.

Ordering Information

Product Name	Cat. No.	Size
Stool Nucleic Acid Isolation Kit	45600	50 preps

SAMPLE COLLECTION & PRESERVATION

Stability at
room temperature

**Stool
Nucleic Acid**



**Saliva
DNA/RNA**



**Urine
DNA/RNA**



Sample Collection and Preservation Kits



cf/ct-DNA

- Sample collection devices for all types of samples: stool, urine, saliva and more
- Collect, preserve and ship samples at room temperature
- User friendly collection
- Affordable price and tremendous savings enabling you to do more on your project
- High quality DNA/RNA for downstream applications
- Compatible with most DNA/RNA Isolation kits and systems
- Available in both research use format and CE-IVD marked for use in in vitro diagnostic workflows

Ordering Information

Product Name	Cat. No.
Stool Nucleic Acid Collection and Preservation Tubes	45660
Stool Nucleic Acid Collection and Preservation Tubes Dx CE	Dx45660
Fecal DNA Collection & Preservation Mini Tubes	27650
Fecal Swab Collection and Preservation System	45670
Saliva DNA Collection and Preservation Devices	RU49000
Saliva DNA Collection and Preservation Devices CE	49000
Saliva DNA Collection, Preservation and Isolation Kit	RU35700
Saliva DNA Collection, Preservation and Isolation Kit CE	35700
Saliva RNA Collection and Preservation Devices	RU53800
Swab Collection and DNA Preservation Kit	45690
Urine Collection and Preservation Tubes - 5 cc	18118
Urine Collection and Preservation Tubes - 15 cc	18122
Urine Collection and Preservation Tubes - 50 cc	18113
Urine Preservative Single Dose	18126

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