RNA/DNA/Protein Purification Plus Kit

Norgen's RNA/DNA/Protein Purification Plus Kit provides a rapid 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 total RNA, genomic DNA and proteins are all column purified in less than 30 minutes. This kit is ideal for researchers who are interested in studying the genome, proteome 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/Protein Purification Plus 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. Analysis will be more reliable since the RNA, DNA and proteins 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.

Purification is based on spin column chromatography. The sample is first lysed, and the DNA is then captured and purified on a DNA Purification Column. The flowthrough of the DNA purification step is then loaded onto a RNA/Protein Purification Column. Total RNA, including microRNAs, will bind to the column while the proteins are removed in the flowthrough. The bound RNA is then washed and eluted from the column. The same RNA/Protein Purification Column is then used to purify the proteins that are present in the RNA binding flowthrough. Alternatively, the kit is provided with a specially formulated loading dye that allows the proteins present in the flowthrough to be loaded directly onto an SDS-PAGE gel. Norgen's kit purifies all sizes of RNA, from large mRNA and ribosomal RNA down to microRNA (miRNA) and small interfering RNA (siRNA). The purified RNA is of the highest integrity, and can be used in a number of downstream applications including real time PCR, reverse transcription PCR, Northern blotting, RNase protection and primer extension, and expression array analysis. The genomic DNA is also of the highest quality, and can be used in various applications including PCR reactions, sequencing, Southern blotting and SNP analysis. The purified proteins can also be used in a number of different downstream applications, such as SDS-PAGE analysis and Western blots.

RNA/DNA/Protein Purification Plus Kit Benefits	
Complete column purification	The RNA, DNA and proteins are all column purified using the same column.
Reduce variability	RNA, DNA and proteins are isolated from a single sample with no splitting of the lysate, thus reducing inconsistent results and variability.
Isolate from small samples	Sequential isolation of RNA, DNA and protein from a single sample. Ideal for precious, difficult to obtain or small samples such as biopsy material or single foci from cell cultures.
Rapid procedure	Isolate total RNA, genomic DNA and total proteins from a single sample in < 30 minutes.
Isolate a diversity of RNA species	All sizes of RNA are isolated, from large mRNA down to microRNA
Process a wide range of sample types	Isolate total RNA, genomic DNA and proteins from cultured animal cells , tissue, blood, bacteria, yeast, fungi and plants.

RNA/DNA/Protein Purification Plus Kit

Kit Specifications			
Column Binding Capacity (RNA)	50 µg	Average Yield:	
Column Binding Capacity (DNA)	20 µg	HeLa Cells (1 x 10^6 cells)	15 µg RNA
Column Binding Capacity (Protein)	200 µg	HeLa Cells (1 x 10^6 cells)	8 µg DNA
Size of RNA Purified	All sizes	HeLa Cells (1 x 10^6 cells)	150 µg protein
Size of DNA Purified	> 30 kbp	Time to Complete 10 Purifications	30 minutes

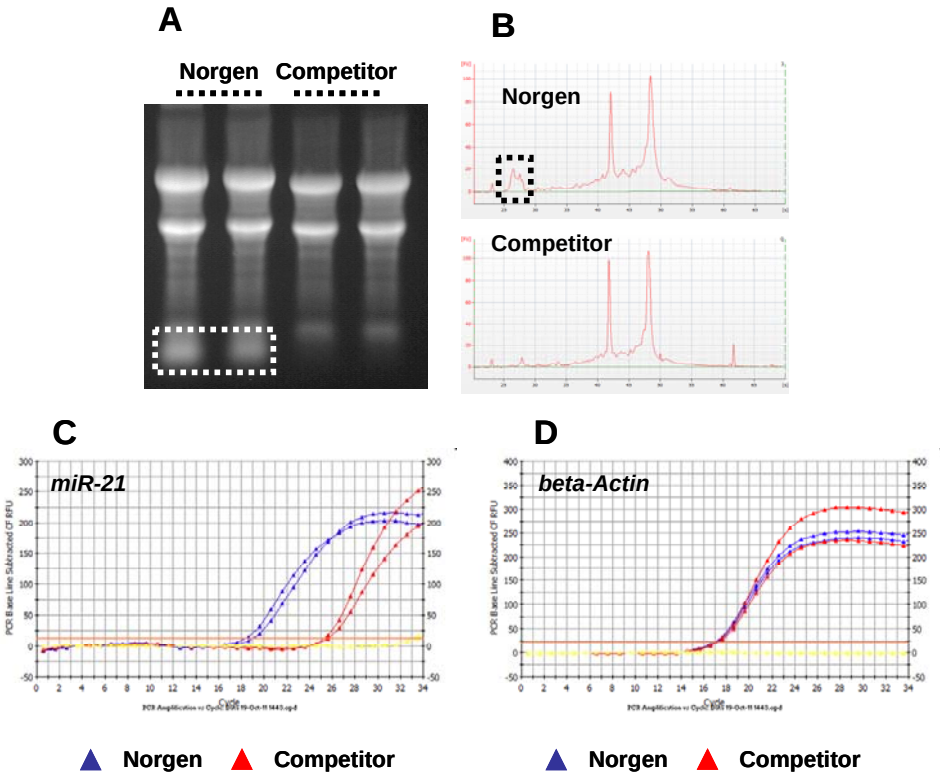
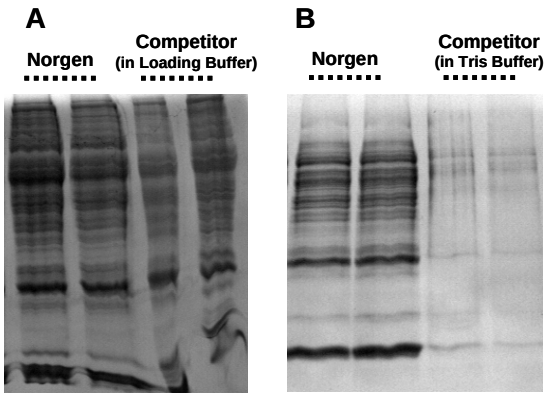


Figure 1. Recovery of True Total RNA including microRNA from Hamster Liver
Panel A is a 1X MOPS 1% agarose gel showing the RNA that was isolated from 2 different samples of 15 mg hamster liver using either Norgen's RNA/DNA/Protein Purification Plus Kit or a competitor's multiple-analyte purification 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 hamster beta-Actin (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)

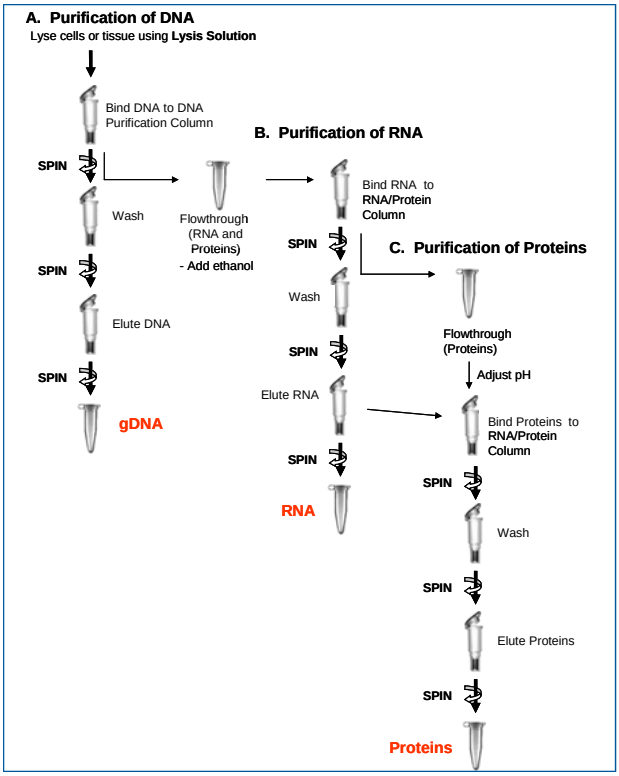
RNA/DNA/Protein Purification Plus Kit

Figure 2. High Quality Total Proteins Eluted in Mass Spec-Compatible Buffer.



Protein fractions (from hamster liver) isolated by Norgen's RNA/DNA/Protein Purification Plus Kit and a competitor's kit were resolved on a 12% SDS-PAGE protein gel. Panel A showed that when the competitor's precipitated protein fraction was resuspended in a provided SDS-PAGE loading buffer, the protein recovery was similar among the two kits. Panel B showed that when the same precipitated protein fraction from the competitor's kit was resuspended in a Tris-based buffer containing no detergent or denaturant, the protein recovery became drastically reduced. In contrast, Norgen's RNA/DNA/Protein Purification Plus Kit purified proteins by column and the eluted proteins are already in a buffer compatible with most downstream applications including mass spectrophotometry as well as standard protein quantification methods (including Bradford assays).

RNA/DNA/Protein Purification Plus Kit Procedure



Customer-Supplied Reagents and Equipment

- Benchtop microcentrifuge
- 95% ethanol
- β-mercaptoethanol (optional)
- RNase-free DNase I (optional)
- RNase-free PBS (Animal Cells)
- TE Buffer and lysozyme (Bacteria)
- Resuspension buffer with lyticase (Yeast)
- Liquid nitrogen, mortar and pestle (Tissue, Fungi, Plant)

Storage Conditions

The Protein Loading Dye should be stored at -20°C upon arrival. All other solutions should be kept tightly sealed and stored at room temperature. These reagents should remain stable for at least 1 year in their unopened containers

Shipping Conditions

The RNA/DNA/Protein Purification Plus Kit is shipped at room temperature.

Cat #	Description	Quantity
47800	RNA/DNA/Protein Purification Plus Kit	20 preps
47700	RNA/DNA/Protein Purification Plus Kit	50 preps

3430 Schmon Parkway, Thorold, ON, Canada L2V 4Y6
www.norgenbiotek.com
Phone: 905-227-8848 Fax: 905-227-1061
North American Toll Free: 1-866-667-4362