NORGEN BIOTEK CORP.

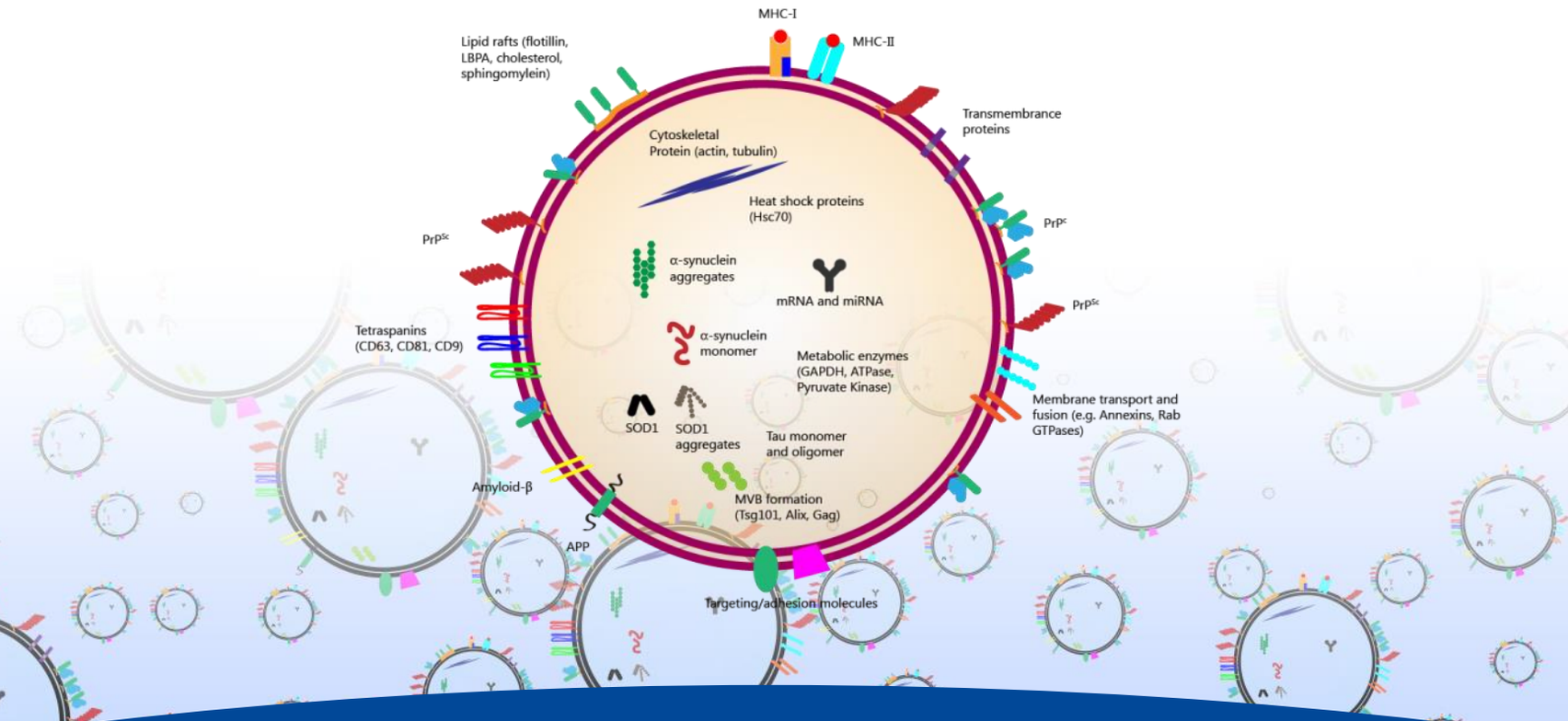
The Sample Preparation Experts

EXOSOMES & MICROVESICLES

The New Standard in Exosome Purification and RNA Isolation

Best-in-Class, Pure & Simple

Exosome Purification, Fractionation of Exosomal Free & Circulating RNA from Bodily Fluids



www.norgenbiotek.com

An ISO 13485:2003, ISO 9001:2008 & ISO 15189:2012 Certified Company

Corporate Headquarters

3430 Schmon Parkway
Thorold, Ontario
CANADA
L2V 4Y6
Phone: (905) 227-8848 or
Toll Free in North America: 1-866-667-4362
Fax: (905) 227-8848
Email: info@norgenbiotek.com
www.norgenbiotek.com

Norgen Biotek is dedicated to providing our customers with first class sample preparation kits for RNA, microRNA, DNA, protein and exosome purification, clean-up and concentration, as well as preservatives for nucleic acid (DNA and RNA) stabilization in various bodily fluids for both research and diagnostic applications; and to providing dedicated and expert support services to our customers and commercial partners worldwide.

Norgen is an **ISO 9001:2008, ISO 13485:2003 and ISO 15189:2012** registered company, indicating our commitment to quality.

ISO 9001:2008 ISO 13485:2003 ISO 15189:2012 CE

V 1.0

Ordering Information

To Order by Phone:
Telephone: (905) 227-8848
Toll Free in North America: 1-866-667-4362

To Order by Fax:
(905) 227-1061

To Order by Email:
orders@norgenbiotek.com

To Order by Mail:
Norgen Biotek Corp.
3430 Schmon Parkway
Thorold, ON
L2V 4Y6
CANADA

Telephone Orders
Customer service representatives are available to receive orders Monday through Friday from 9:00 A.M. to 5:30 P.M. EST (Eastern Standard Time).

When placing an order, please be prepared to provide us with the following information:

1. Purchase order number
2. Customer number (if known)
3. Billing Address
4. Shipping Address
5. Name of person to whose attention the order should be shipped
6. Name, telephone number and email of contact person
7. Product catalogue number, description, size and quantity

Email and Fax Orders
We also accept orders by email, fax and mail. When placing an order by email, fax or mail, please ensure that the information listed above is included in order to expedite ordering.

Technical Support

Contact our Technical Support Team between the hours of 9:00 and 5:30 EST (Eastern Standard Time) at (905) 227-8848 or Toll Free in North America at 1-866-667-4362.

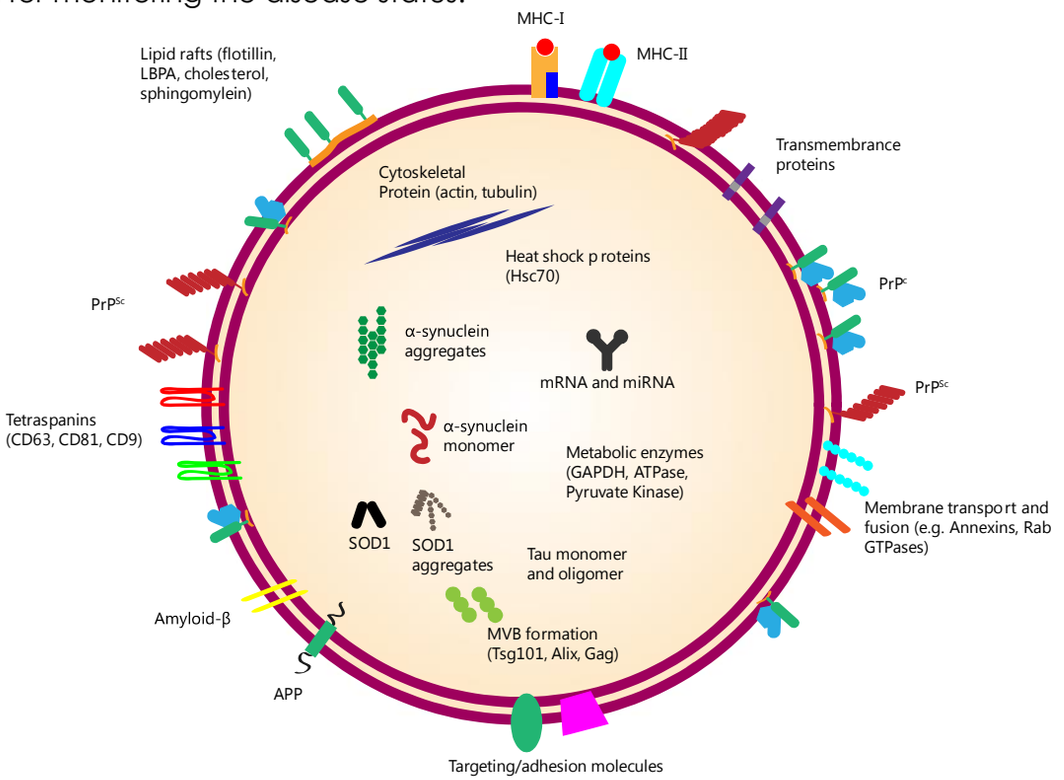
Technical support can also be obtained from our website (www.norgenbiotek.com) or through email at techsupport@norgenbiotek.com.

EXOSOMES

Exosomes are 40 - 150 nm membrane vesicles which are secreted by most cell types. Exosomes can be found in cell culture media, plasma, serum, saliva, urine, amniotic fluid and malignant ascite fluids, among other biological fluids.

Evidence has been accumulating recently that these vesicles act as cellular messengers, conveying information to distant cells and tissues within the body. The exosomes contain cell-specific proteins, lipids and RNAs, which are transported to other cells, where they can alter function and/or physiology. These exosomes may play a functional role in mediating adaptive immune responses to infectious agents and tumours, tissue repair, neural communication and transfer of pathogenic proteins. Recent work has demonstrated the presence of distinct subsets of microRNAs within exosomes and other extracellular vesicles (EVs) which depend upon the tumour cell type from which they are secreted. For this reason exosomal RNA may serve as biomarkers for various diseases including cancer.

Another subset of RNA that is found in bodily fluids and cell culture media is the free-circulating RNA (fc-RNA). These fc-RNA are usually protein-bound RNA that are leaked from cells either during apoptosis or necrosis. As the RNA molecules encapsulated within exosomes or bound to proteins (fc-RNA) are protected from degradation by RNAses, they can be efficiently recovered from bodily fluids and cell culture media. In general, these two RNA groups contain valuable information for the discovery of biomarkers that can help with early detection of certain cancer types and for monitoring the disease status.



Norgen has developed a comprehensive basket of kits that constitute an all-in-one system for the purification, isolation and fractionation of exosomal RNA and free-circulation RNA from plasma, serum, ascitic fluid, urine, saliva and cell culture media. As the RNA molecules encapsulated within exosomes are protected from degradation by RNAses they can be efficiently recovered from biological fluids. Norgen's kits therefore make exosomal RNA discovery simple, rapid and reliable. Users can simultaneously concentrate and isolate high quality exosomal RNA, including microRNA, for use in sensitive downstream assays.

Exosome Sample Preparation Kits

Kit Name	Cat. #	Kit size	Sample Size
Intact Exosome Purification			
Plasma/Serum Exosome Purification Mini Kit	57400	50 preps	50 µL-1 mL
Plasma/Serum Exosome Purification Midi Kit	57500	25 preps	1-4 mL
Plasma/Serum Exosome Purification Maxi Kit	57600	15 preps	4-10 mL
Urine Exosome Purification Mini Kit	57700	50 preps	250 µL-1 mL
Urine Exosome Purification Midi Kit	57800	25 preps	2-10 mL
Urine Exosome Purification Maxi Kit	57900	15 preps	11-30 mL
Cell Culture Media Exosome Purification Mini Kit	60400	50 preps	5-10 mL
Cell Culture Media Exosome Purification Midi Kit	60500	25 preps	10-20 mL
Cell Culture Media Exosome Purification Maxi Kit	60600	15 preps	20-35 mL
RNA Isolation from Exosomes Purified using Norgen's Exosome Purification Kits			
Exosome RNA Isolation Kit	58000	50 preps	Variable
Intact Exosome Purification and RNA Isolation (Combination Kits)			
Plasma/Serum Exosome Purification and RNA Isolation Mini Kit	58300	50 preps	50 µL-1 mL
Plasma/Serum Exosome Purification and RNA Isolation Midi Kit	58500	25 preps	1-4 mL
Plasma/Serum Exosome Purification and RNA Isolation Midi Kit	58600	15 preps	4-10 mL
Urine Exosome Purification and RNA Isolation Mini Kit	58400	50 preps	250 µL-1 mL
Urine Exosome Purification and RNA Isolation Midi Kit	58700	25 preps	2-10 mL
Urine Exosome Purification and RNA Isolation Midi Kit	58800	15 preps	11-30 mL
Cell Culture Media Exosome Purification and RNA Isolation Mini Kit	60700	50 preps	5-10 mL
Cell Culture Media Exosome Purification and RNA Isolation Midi Kit	60800	25 preps	10-20 mL
Cell Culture Media Exosome Purification and RNA Isolation Midi Kit	60900	15 preps	20-35 mL
Exosomal and Free-Circulating RNA Fractionation Kits			
Plasma/Serum Exosome and Free-Circulating RNA Isolation Mini Kit	59500	50 preps	50 µL-1 mL
Plasma/Serum Exosome and Free-Circulating RNA Isolation Midi Kit	59600	25 preps	1-4 mL
Plasma/Serum Exosome and Free-Circulating RNA Isolation Maxi Kit	59700	15 preps	4-10 mL
Urine Exosome and Free-Circulating RNA Isolation Mini Kit	59200	50 preps	250 µL-1 mL
Urine Exosome and Free-Circulating RNA Isolation Midi Kit	59300	25 preps	2-10 mL
Urine Exosome and Free-Circulating RNA Isolation Maxi Kit	59400	15 preps	11-30 mL
Exosome Depletion			
FBS Exosome Depletion Kits (Slurry Format)	61100 61400	6 preps 12 preps	Up to 140 mL Up to 280 mL
FBS Exosome Depletion Kits (Column Format)	61200 61300	6 preps 12 preps	Up to 120 mL Up to 240 mL

Intact Exosome Purification

Plasma/Serum Exosome Purification Kits (Mini, Midi, Maxi)

Cat. # 57400, 57500, 57600

Rapid and simple purification of intact exosomes from plasma/serum samples

The Plasma/Serum Exosome Purification Kits provide a fast, reliable and convenient method to purify and enrich for pure intact exosomes from different plasma/serum sample volumes ranging from 50 µL to 10 mL. These kits also allow for the purification of intact extracellular vesicles (EVs) from different plasma/serum sample volumes, and these EVs are ready for any downstream application. The purification is based on Norgen's proprietary resin.

These kits provide a clear advantage over other available methods since they do not require any special instrumentation, ultracentrifugation, precipitation reagents or any protease treatments. More importantly, the purified exosomes will not be contaminated with any other RNA-binding proteins that may contaminate your exosomal RNA, which is essential if studying exosomal RNA gene expression

Features and Benefits

- Purification and enrichment of intact plasma/serum exosomes for functional studies
- Versatile sample input ranging from 50 µL to 10 mL
  - Plasma/Serum Exosome Purification Mini Kit (50 µL - 1 mL Plasma/Serum) - Cat. 57400
  - Plasma/Serum Exosome Purification Midi Kit (1 mL - 4 mL Plasma/Serum) - Cat. 57500
  - Plasma/Serum Exosome Purification Maxi Kit (4 mL - 10 mL Plasma/Serum) - Cat. 57600
- No time-consuming ultracentrifugation, filtration nor special syringes required
- No overnight incubation required
- No protease treatment required
- Compatible with plasma/serum from any species
- Pure exosomes are purified and are free-from any other RNA -binding proteins
- Purified exosomes can be analyzed using NanoSight® or Electron Microscopy for assessing the approximate exosome size range and concentration.
- No contamination with precipitation reagents

Feature	Specifications
Minimum Plasma/Serum Input	50 µL
Maximum Plasma/Serum Input	10 mL
Size of Exosomes Purified	40 nm - 150 nm
Time to Complete 10 Purifications	15 - 30 minutes

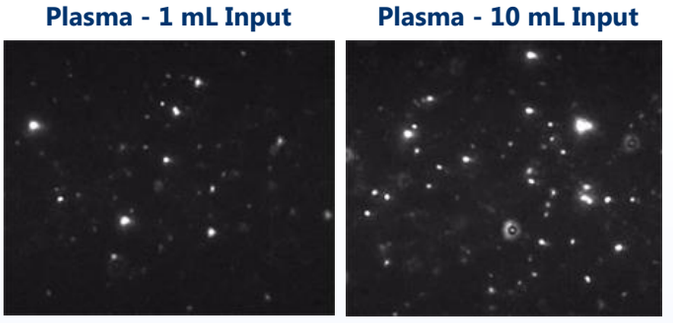


Figure 1. Intact exosomes purified from 1 mL and 10 mL plasma. Intact exosomes were purified from 1 mL plasma using Norgen's Plasma/Serum Mini Kit (Cat. 57400) and from 10 mL plasma using Norgen's Plasma/Serum Maxi Kit (Cat. 57600). Exosomes purified using Norgen's Mini kit were resuspended in 200 µL of Norgen's ExoR buffer whereas exosomes purified using Norgen's Maxi kit were resuspended in 600 µL Norgen's ExoR buffer, diluted 1:1,000 and visualized on the NanoSight® LM10 instrument. The analysis shows that the purification of exosomes is linear as 4.04 x 10^{10} particles/mL was recovered from 1 mL plasma whereas 2.95 x 10^{11} particles/mL was recovered from 10 mL plasma.

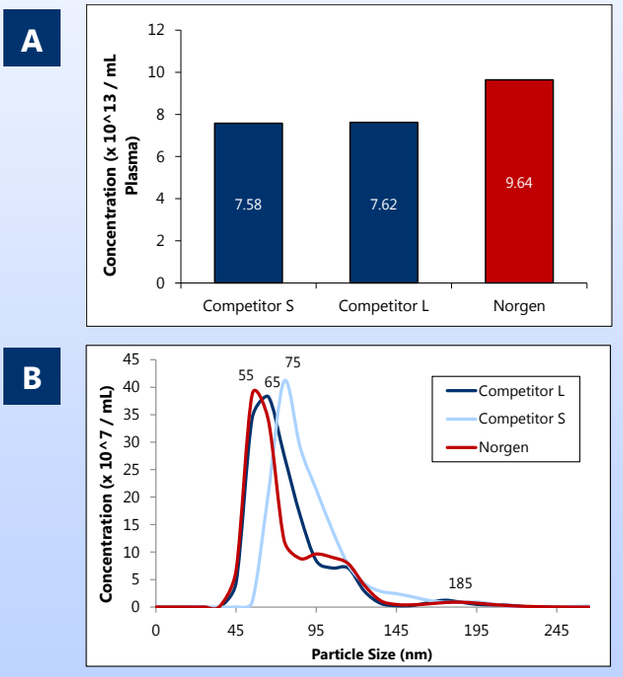


Figure 2. Intact exosomes were purified from 1 mL plasma using different purification methods. Intact exosomes were purified from 1 mL plasma using Norgen's Plasma/Serum Exosome Purification Mini Kit (Cat# 57400), Competitor S's kit and Competitor L's kit. Exosomes purified using Norgen's kit were resuspended in 200 µL of Norgen's ExoR buffer, diluted 1:1,000 and visualized on the NanoSight® LM10 instrument. The analysis shows that Norgen's kit isolated 55 nm exosomes with a recovery of 9.64 x 10^{13} particles/mL plasma. No impurities were found to be contaminating the exosomes purified using Norgen's kit. Additionally, exosomes with a broader size range covering from 50 nm - 150 nm were purified from 1 mL plasma with a higher concentration compared to the other two methods.

Note: *Figure 1 and 2 show data from 2 different samples and are not related.*

Urine Exosome Purification Kits (Mini, Midi, Maxi)

Cat. # 57700, 57800, 57900

Rapid and simple purification of intact exosomes from urine samples

The Urine Exosome Purification Kits provide a fast, reliable and convenient method to purify and enrich for pure intact exosomes from different urine sample volumes ranging from 250 µL to 30 mL. These kits also allow for the purification of intact extracellular vesicles (EVs) from different urine sample volumes, and these EVs are ready for any downstream application. The purification is based on Norgen's proprietary resin.

These kits provide a clear advantage over other available methods since they do not require any special instrumentation, ultracentrifugation, precipitation reagents or any protease treatments. More importantly, the purified exosomes will not be contaminated with any other RNA-binding proteins that may contaminate your exosomal RNA, which is essential if studying exosomal RNA gene expression.

Features and Benefits

- Purification and enrichment of intact urine exosomes for functional studies
- Versatile sample input ranging from 250 µL to 30 mL
  - Urine Exosome Purification Mini Kit (250 µL - 1 mL Urine) - Cat. 57700
  - Urine Exosome Purification Midi Kit (2 mL - 10 mL Urine) - Cat. 57800
  - Urine Exosome Purification Maxi Kit (11 mL - 30 mL Urine) - Cat. 57900
- No time-consuming ultracentrifugation, filtration nor special syringes required
- No overnight incubation required
- No protease treatment required
- Compatible with urine from any species
- Pure exosomes are purified and are free-from any other RNA -binding proteins
- Purified exosomes can be analyzed using NanoSight® or Electron Microscopy for assessing the approximate exosome size range and concentration.
- No contamination with precipitation reagents

Feature	Specifications
Minimum Urine Input	250 µL
Maximum Urine Input	30 mL
Size of Exosomes Purified	40 nm - 150 nm
Time to Complete 10 Purifications	15 - 30 minutes

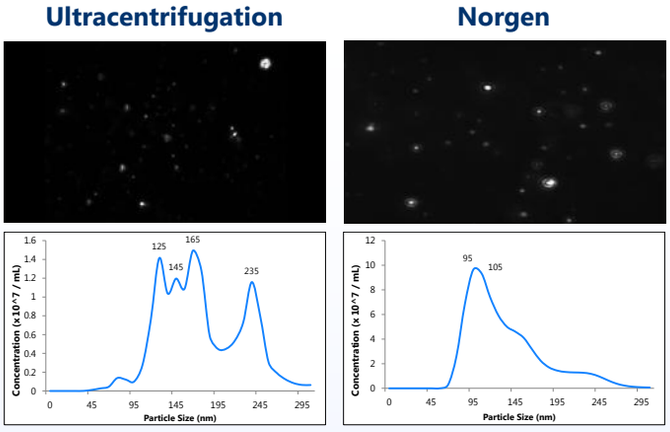


Figure 1. Intact Exosomes were purified from 10 mL urine using Norgen's Urine Exosome Purification Midi Kit and Ultracentrifugation. Exosomes purified using Norgen's kit and ultracentrifugation were resuspended in 400 µL of Norgen's ExoR buffer, diluted 1:1,000 and visualized on the NanoSight® LM10 instrument. The analysis shows that Norgen's kit purified exosomes with sizes ranging from 65 nm to 195 nm, with a total recovery of 7.63 x 10^8 particles/mL. No impurities were found to be contaminating the exosomes purified using Norgen's Urine Exosome Purification Midi Kit as opposed to the exosomes purified using ultracentrifugation, which purified exosomes with larger particle sizes ranging from 125 nm - 235 nm with a total recovery of 1.56 x 10^8 particles/mL.

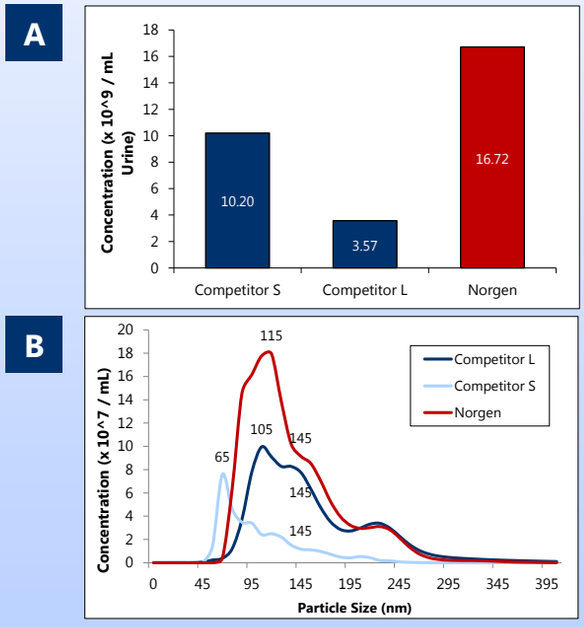


Figure 2. Intact exosomes purified from 5 mL using different purification methods. Intact exosomes were purified from 5 mL urine using Norgen's Urine Exosome Purification Midi Kit, Competitor S's kit, and Competitor L's kit. Exosomes purified using Norgen's kit were resuspended in 400 µL of Norgen's ExoR buffer, diluted 1:1,000 and visualized on the NanoSight® LM10 instrument. The analysis shows that Norgen's kit isolated 115 nm exosomes with a recovery of 8.36 x 10^9 particles/mL urine samples. No impurities were found to be contaminating the exosomes purified using Norgen's Urine Exosome Purification Midi Kit. Additionally, exosomes with a broader size range covering from 75nm - 250nm were purified from 5 mL urine with a higher concentration as compared to the other two methods.

Note: *Figure 1 and 2 show data from 2 different samples and are not related.*

RNA Isolation from Exosomes Purified using Norgen's Exosome Purification Kits

Exosome RNA Isolation Kit — Cat. # 58000

Rapid and simple isolation of exosomal RNA from exosomes purified from different plasma/serum, urine, saliva and culture media sample volumes

The Exosome RNA Isolation Kit provide a fast, reliable and convenient method to isolate and concentrate exosomal RNA from exosomes previously purified from plasma/serum, urine, saliva or cell culture media using Norgen's exosome purification kits. This kits also allow for the isolation of RNA from intact extracellular vesicles (EVs) from different urine, saliva, cell culture media or plasma/serum sample volumes. The purification is based on Norgen's proprietary resin.

The Exosomal RNA Isolation Kit is designed to isolate all sizes of extracellular vesicle RNA, including microRNA. The kit provides a clear advantage over other available kits in that it does not require any special instrumentation, protein precipitation reagents, extension tubes, phenol/chloroform or protease treatments. Moreover, the kit allows the user to elute into a flexible elution volume ranging from 50 µL to 100 µL. 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 assays.

Features and Benefits

- Isolate all sizes of exosomal and extracellular vesicle RNA, including microRNA
- Bind and elute all RNA irrespective of size or GC content, without bias
- No phenol extractions, Proteinase K treatment, nor carrier RNA required
- Concentrate isolated RNA into a flexible elution volume ranging from 50 µL to 100 µL
- Purify high-quality RNA in 35-45 minutes
- No contamination with precipitation reagents

Feature	Specifications
Sample Type	Plasma/Serum, Cell Culture Media or Urine Exosomes Purified using Norgen's Exosome Purification kits
Size of RNA Purified	All sizes, including miRNA and small RNA (< 200 nt)
Elution Volume	50-100 µL
Time to Complete 10 Purifications	35 –45 minutes
Average Yields	Variable depending on specimen

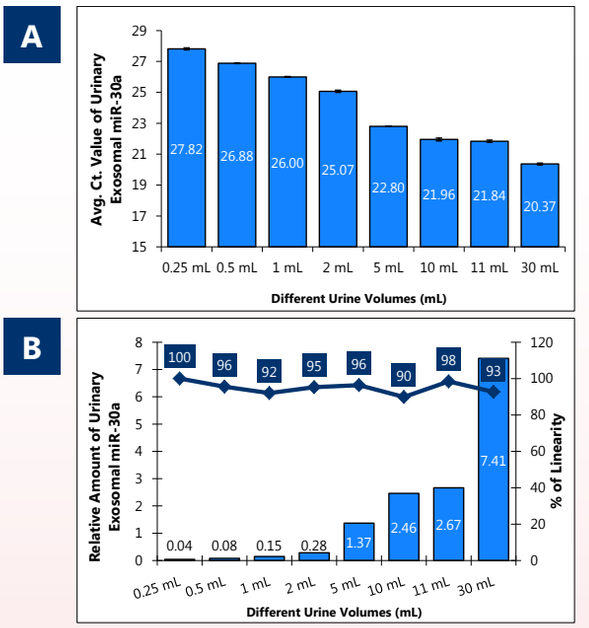


Figure 1. Isolation of RNA from exosomes purified from different urine volumes. Norgen's Exosomal RNA Isolation Kit (Cat# 58800) was used to isolate RNA from exosomes isolated from different urine volumes purified using Norgen's Urine Exosome Purification Kits (Cat# 57700, 57800 and 57900). Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated urinary exosomal miR-30a. (A) The urinary exosomal miR-30a is linearly decreasing with increasing the sample input volume. B) The relative amount of the urinary exosomal miR-30a shows excellent linearity with a percentage of recovery of more than 90%.

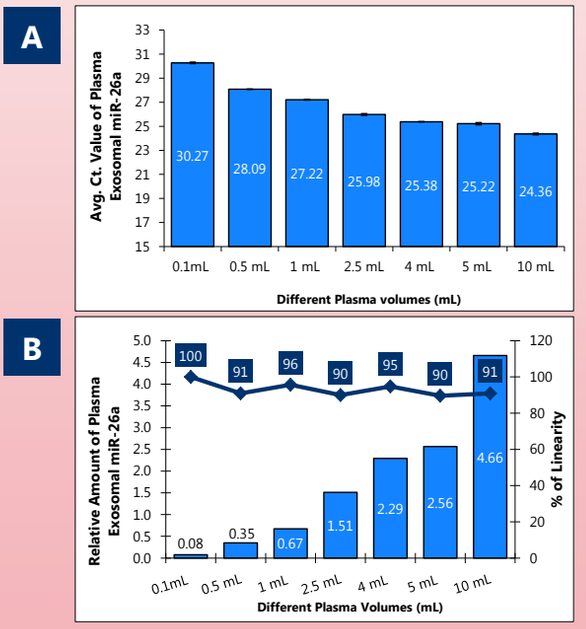


Figure 2. Isolation of RNA from exosomes purified from different plasma volumes. Norgen's Exosomal RNA Isolation Kit (Cat# 58800) was used to isolate RNA from exosomes isolated from different plasma volumes purified using Norgen's Plasma/Serum Exosome Purification Kits (Cat# 57400, 57500 and 57600). Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated plasma exosomal miR-26a. (A) The plasma exosomal miR-26a is linearly decreasing with increasing the sample input volume. B) The relative amount of the plasma exosomal miR-26a shows excellent linearity with a percentage of recovery of more than 90%.

Plasma/Serum Exosome Purification and RNA Isolation Kits (Mini, Midi, Maxi)

Cat. # 58300, 58500, 58600

Rapid and simple purification of intact exosomes and RNA isolation from plasma/serum samples

Norgen's Plasma/Serum Exosome and RNA Isolation Kits constitute an all-in-one system for the purification of exosomes and the sequential isolation of exosomal RNA from different plasma/serum sample volumes ranging from 50 µL to 10 mL. The purification is based on spin column chromatography that employs Norgen's proprietary resin. The kit is designed to isolate all sizes of extracellular vesicle RNA, including microRNA.

The kits provide a clear advantage over other available kits in that they do not require any special instrumentation, protein precipitation reagents, extension tubes, phenol/chloroform or protease treatments. Moreover, the kits allow the user to elute into a flexible elution volume ranging from 50 µL to 100 µL. The RNA isolated from the purified exosomes is free from any protein-bound circulating RNA and is of the highest integrity. The purified RNA 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 assays.

Features and Benefits

- Purification and enrichment of intact plasma/serum exosomes for functional studies
- Versatile sample input ranging from 50 µL to 10 mL
    - Plasma/Serum Mini Kit (50 µL - 1 mL) - Cat. 58300
    - Plasma/Serum Midi Kit (1mL - 4 mL) - Cat. 58500
    - Plasma/Serum Maxi Kit (4 mL - 10 mL) - Cat. 58600
- Isolate all sizes of exosomal and extracellular vesicle RNA, including microRNA and irrespective of size or GC content, without bias
- No phenol extractions, Proteinase K treatment, nor carrier RNA required
- No time-consuming ultracentrifugation, filtration nor special syringes required
- No overnight incubation required
- Pure exosomes are purified and are free from any other RNA-binding proteins
- No contamination with precipitation reagents

Feature	Specifications
Sample Input Volume	50 µL - 10 mL
Size of RNA Purified	All sizes, including miRNA and small RNA (< 200 nt)
Elution Volume	50-100 µL
Average Yields	Variable depending on specimen
Time to Complete 10 Purifications	35 –45 minutes

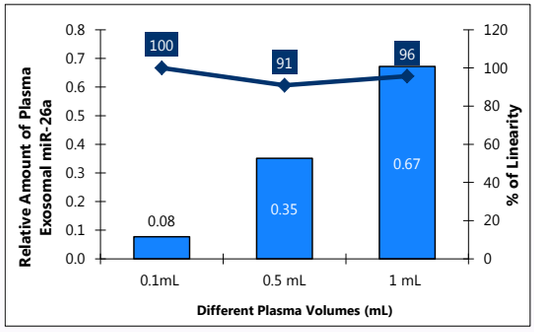


Figure 1. Isolation of RNA from exosomes purified from different plasma volumes. Norgen's Plasma/Serum Exosome Purification and RNA Isolation Mini Kit (Cat# 58300) was used to isolate RNA from exosomes purified from different plasma volumes using the same kit. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated plasma exosomal miR-26a. The relative amount of the plasma exosomal miR-26a shows excellent linearity with a percentage of recovery of more than 90%.

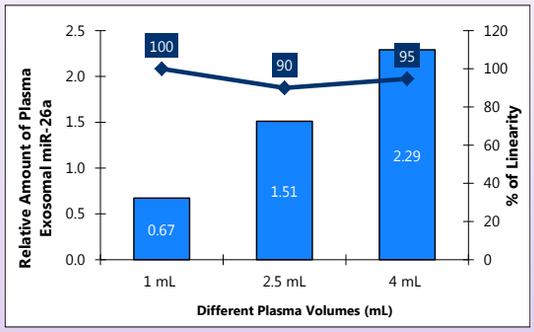


Figure 2. Isolation of RNA from exosomes purified from different plasma volumes. Norgen's Plasma/Serum Exosome Purification and RNA Isolation Midi Kit (Cat# 58500) was used to isolate RNA from exosomes purified from different plasma volumes using the same kit. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated plasma exosomal miR-26a. The relative amount of the plasma exosomal miR-26a shows excellent linearity with a percentage of recovery of more than 90%.

Intact Exosome Purification and RNA Isolation (Combination Kits)

Urine Exosome Purification and RNA Isolation Kits (Mini, Midi, Maxi)

Cat. # 58400, 58700, 58800

Rapid and simple purification of intact exosomes and RNA isolation from urine samples

Norgen's Urine Exosome and RNA Isolation Kits constitute an all-in-one system for the purification of exosomes and the sequential isolation of exosomal RNA from different urine sample volumes ranging from 250 µL to 30 mL. The purification is based on spin column chromatography that employs Norgen's proprietary resin. The kit is designed to isolate all sizes of extracellular vesicle RNA, including microRNA.

The kits provide a clear advantage over other available kits in that they do not require any special instrumentation, protein precipitation reagents, extension tubes, phenol/chloroform or protease treatments. Moreover, the kits allow the user to elute into a flexible elution volume ranging from 50 µL to 100 µL. The RNA isolated from the purified exosomes is free from any protein-bound circulating RNA and is of the highest integrity. The purified RNA 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 assays.

Features and Benefits

- Purification and enrichment of intact urine exosomes for functional studies
- Versatile sample input ranging from 250 µL to 30 mL
  - Urine Mini Kit (250 µL - 1 mL) - Cat. 58400
  - Urine Midi Kit (2 mL - 10 mL) - Cat. 58700
  - Urine Maxi Kit (11 mL - 30 mL) - Cat. 58800
- Isolate all sizes of exosomal and extracellular vesicle RNA, including microRNA and irrespective of size or GC content, without bias
- No phenol extractions, Proteinase K treatment, nor carrier RNA required
- No time-consuming ultracentrifugation, filtration nor special syringes required
- No overnight incubation required
- Pure exosomes are purified and are free from any other RNA-binding proteins
- No contamination with precipitation reagents

Feature	Specifications
Sample Input Volume	250 µL - 30 mL
Size of RNA Purified	All sizes, including miRNA and small RNA (< 200 nt)
Elution Volume	50-100 µL
Average Yields	Variable depending on specimen
Time to Complete 10 Purifications	35 –45 minutes

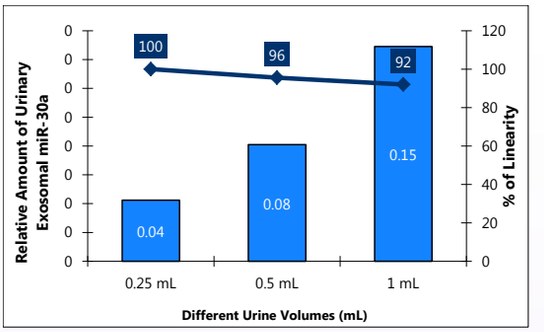


Figure 1. Isolation of RNA from exosomes purified from different urine volumes. Norgen's Urine Exosome Purification and RNA Isolation Mini Kit (Cat# 58400) was used to isolate RNA from exosomes purified from different urine volumes using the same kit. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated urinary exosomal miR-30a. The relative amount of the urinary exosomal miR-30a shows excellent linearity with a percentage of recovery of more than 90%.

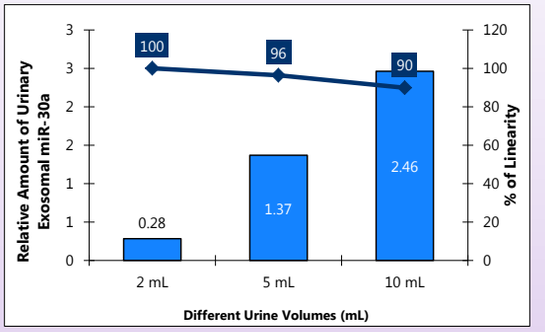


Figure 2. Isolation of RNA from exosomes purified from different urine volumes. Norgen's Urine Exosome Purification and RNA Isolation Midi Kit (Cat# 58700) was used to isolate RNA from exosomes purified from different urine volumes using the same kit. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated urinary exosomal miR-30a. The relative amount of the urinary exosomal miR-30a shows excellent linearity with a percentage of recovery of more than 90%.

Cell Culture Media Exosome Purification and RNA Isolation Kits (Mini, Midi, Maxi)

Cat. # 60700, 60800, 60900

Rapid and simple purification of intact exosomes and RNA isolation from cell culture media samples

Norgen's Cell Culture Media Exosome and RNA Isolation Kits constitute an all-in-one system for the purification of exosomes and the sequential isolation of exosomal RNA from different cell culture media sample volumes ranging from 5 mL to 35 mL. The purification is based on spin column chromatography that employs Norgen's proprietary resin. The kit is designed to isolate all sizes of extracellular vesicle RNA, including microRNA.

The kits provide a clear advantage over other available kits in that they do not require any special instrumentation, protein precipitation reagents, extension tubes, phenol/chloroform or protease treatments. Moreover, the kits allow the user to elute into a flexible elution volume ranging from 50 µL to 100 µL. The RNA isolated from the purified exosomes is free from any protein-bound circulating RNA and is of the highest integrity. The purified RNA 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 assays.

Features and Benefits

- Purification and enrichment of intact cell culture media exosomes for functional studies
- Versatile sample input ranging from 50 µL to 10 mL
    - Cell Culture Media Mini Kit (5 mL - 10 mL) - Cat. 60700
    - Cell Culture Media Midi Kit (10 mL - 20 mL) - Cat. 60800
    - Cell Culture Media Maxi Kit (20 mL - 35 mL) - Cat. 60900
- Isolate all sizes of exosomal and extracellular vesicle RNA, including microRNA and irrespective of size or GC content, without bias
- No phenol extractions, Proteinase K treatment, nor carrier RNA required
- No time-consuming ultracentrifugation, filtration nor special syringes required
- No overnight incubation required
- Pure exosomes are purified and are free from any other RNA-binding proteins
- No contamination with precipitation reagents

Feature	Specifications
Sample Input Volume	250 µL - 30 mL
Size of RNA Purified	All sizes, including miRNA and small RNA (< 200 nt)
Elution Volume	50-100 µL
Average Yields	Variable depending on specimen
Time to Complete 10 Purifications	35 –45 minutes

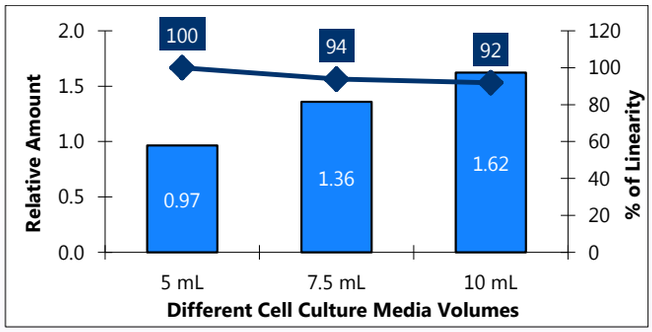


Figure 1. Isolation of RNA from exosomes purified from different cell culture media volumes. Norgen's Cell Culture Media Exosome Purification and RNA Isolation Mini Kit (Cat# 60700) was used to isolate exosomal RNA from exosomes purified from different cell culture media volumes using the same kit. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated exosomal RNA. The relative amount of the exosomal miR-26a shows excellent linearity with a percentage of recovery of more than 90%.

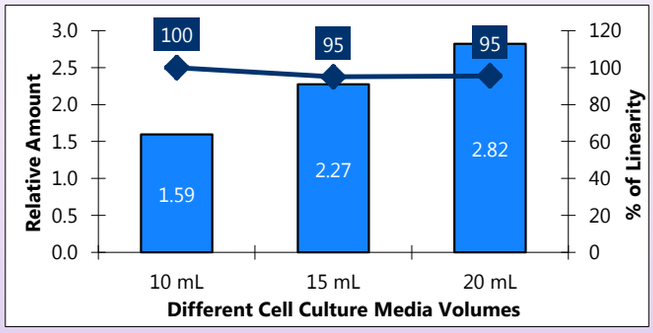


Figure 2. Isolation of RNA from exosomes purified from different cell culture media volumes. Norgen's Cell Culture Media Exosome Purification and RNA Isolation Midi Kit (Cat# 60800) was used to isolate exosomal RNA from exosomes purified from different cell culture media volumes using the same kit. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated exosomal RNA. The relative amount of the exosomal miR-26a shows excellent linearity with a percentage of recovery of more than 90%.

Plasma/Serum Exosome and Free Circulating RNA Isolation Kits (Mini, Midi, Maxi)

Cat. # 59500, 59600, 59700

Rapid and simple sequential isolation of exosomal and free-circulating RNA from different plasma/serum sample volumes

The Plasma/Serum Exosome and Free-Circulating RNA Isolation Kits provide a fast, reliable and convenient method to sequentially isolate and concentrate exosomal RNA as well as free-circulating RNA from different plasma/serum sample volumes ranging from 50 µL to 10 mL. The purification is based on spin column chromatography that employs Norgen's proprietary resin. The kit is designed to isolate all sizes of extracellular vesicle RNA, including microRNA as well as all sizes of the free-circulating protein-bound RNA, including microRNA.

These kits provide a clear advantage over other available kits in that they do not require any special instrumentation, protein precipitation reagents, extension tubes, phenol/chloroform or protease treatments. Moreover, the kits allow the user to elute into a flexible elution volume ranging from 50 µL to 100 µL. The RNA isolated from the purified exosomes is free from any protein-bound circulating RNA. Moreover, the free-circulating, protein-bound, RNA is free from any exosomal RNA. The purified RNA 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 assays.

Features and Benefits

- Isolate all sizes of exosomal, extracellular vesicle RNA and free-circulating RNA, including microRNA
- Versatile sample input ranging from 50 µL to 10 mL
    - Plasma/Serum Mini Kit (50 µL - 1 mL Plasma/Serum) - Cat. 59500
    - Plasma/Serum Midi Kit (1 mL - 4 mL Plasma/Serum) - Cat. 59600
    - Plasma/Serum Maxi Kit (4 mL - 10 mL Plasma/Serum) - Cat. 59700
- Bind and elute all RNA irrespective of size or GC content, without bias
- The purified exosomal RNA is free from any circulating RNA-binding proteins
- No time-consuming ultracentrifugation, filtration, special syringes nor protease treatment required
- No overnight incubation required
- No contamination with precipitation reagents

Feature	Specifications
Sample Input Volume	50 µL - 10 mL
Size of RNA Purified	All sizes, including miRNA and small RNA (< 200 nt)
Elution Volume	50-100 µL
Average Yields	Variable depending on specimen
Time to Complete 10 Purifications	35 –45 minutes

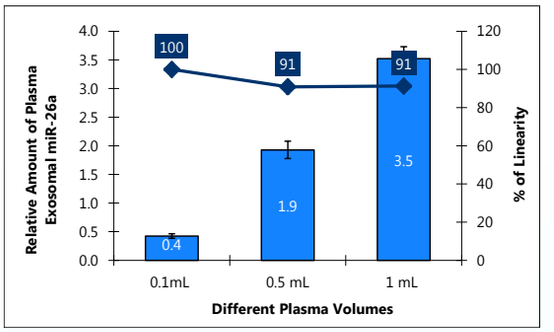


Figure 1. Isolation of RNA from exosomes purified from different plasma volumes. Norgen's Plasma/Serum Exosome and Free-Circulating RNA Isolation Mini Kit (Cat# 59500) was used to isolate exosomal RNA from different plasma volumes ranging from 0.1 mL and up to 1 mL. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated plasma exosomal miR-26a. The relative amount of the plasma exosomal miR-26a shows excellent linearity with a percentage of recovery of more than 90%.

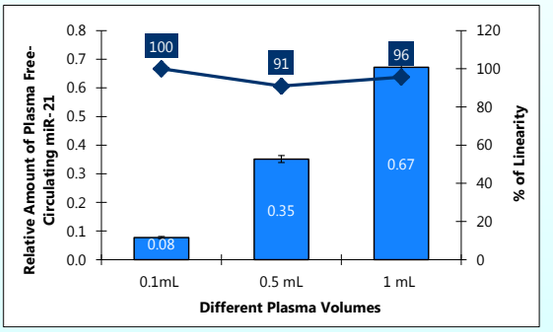


Figure 2. Isolation of free-circulating RNA after the isolation of exosomal RNA from different plasma volumes. Norgen's Plasma/Serum Exosome and Free-Circulating RNA Isolation Mini Kit (Cat# 59500) was used to isolate free-circulating RNA after the isolation of exosomal RNA from different plasma volumes ranging from 0.1 mL and up to 1 mL. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated plasma free-circulating miR-21. The relative amount of the free-circulating miR-21 shows excellent linearity with a percentage of recovery of more than 90%.

Urine Exosome and Free Circulating RNA Isolation Kits (Mini, Midi, Maxi)

Cat. # 59200, 59300, 59400

Rapid and simple sequential isolation of exosomal and free-circulating RNA from different urine sample volumes

The Urine Exosome and Free-Circulating RNA Isolation Kits provide a fast, reliable and convenient method to sequentially isolate and concentrate exosomal RNA as well as free-circulating RNA from different plasma/serum sample volumes ranging from 250 µL to 30 mL. The purification is based on spin column chromatography that employs Norgen's proprietary resin. The kit is designed to isolate all sizes of extracellular vesicle RNA, including microRNA as well as all sizes of the free-circulating protein-bound RNA, including microRNA.

These kits provide a clear advantage over other available kits in that they do not require any special instrumentation, protein precipitation reagents, extension tubes, phenol/chloroform or protease treatments. Moreover, the kits allow the user to elute into a flexible elution volume ranging from 50 µL to 100 µL. The RNA isolated from the purified exosomes is free from any protein-bound circulating RNA. Moreover, the free-circulating, protein-bound, RNA is free from any exosomal RNA. The purified RNA 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 assays.

Features and Benefits

- Isolate all sizes of exosomal, extracellular vesicle RNA and free-circulating RNA, including microRNA
- Versatile sample input ranging from 250 µL to 30 mL
    - Urine Mini Kit (250 µL - 1 mL urine) - Cat. 59200
    - Urine Midi Kit (2 mL - 10 mL urine) - Cat. 59300
    - Urine Maxi Kit (11 mL - 30 mL urine) - Cat. 59400
- Bind and elute all RNA irrespective of size or GC content, without bias
- The purified exosomal RNA is free from any circulating RNA-binding proteins
- No time-consuming ultracentrifugation, filtration, special syringes nor protease treatment required
- No overnight incubation required
- No contamination with precipitation reagents

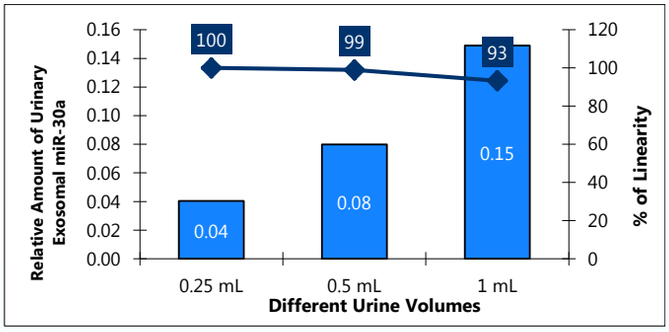


Figure 1. Isolation of RNA from exosomes purified from different urine volumes. Norgen's Urine Exosome and Free-Circulating RNA Isolation Mini Kit (Cat# 59200) was used to isolate exosomal RNA from different urine volumes ranging from 0.25 mL and up to 1 mL. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated urinary exosomal miR-30a. The relative amount of the urinary exosomal miR-30a shows excellent linearity with a percentage of recovery of more than 90%.

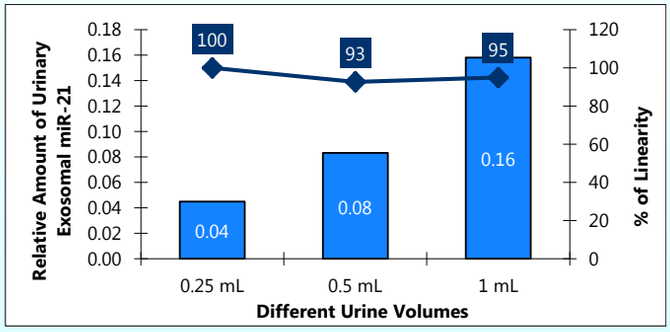


Figure 2. Isolation of free-circulating RNA after the isolation of exosomal RNA from different urine volumes. Norgen's Urine Exosome and Free-Circulating RNA Isolation Mini Kit (Cat# 59200) was used to isolate free-circulating RNA after the isolation of exosomal RNA from different urine volumes ranging from 0.25 mL and up to 1 mL. Two microlitres of the isolated RNA was then used as the template in RT-qPCR reactions to assess the amplification of the isolated urinary free-circulating miR-21. The relative amount of the free-circulating miR-21 shows excellent linearity with a percentage of recovery of more than 90%.

Feature	Specifications
Sample Input Volume	250 µL - 30 mL
Size of RNA Purified	All sizes, including miRNA and small RNA (< 200 nt)
Elution Volume	50-100 µL
Average Yields	Variable depending on specimen
Time to Complete 10 Purifications	35 –45 minutes

FBS Exosome Depletion Kit I (Slurry Format) — Cat. # 61100
FBS Exosome Depletion Kit II (Slurry Format) — Cat. # 61400

Rapid and simple depletion of cow's exosomes from fetal bovine serum (slurry format)

Most culture medium used for the growth and propagation of cells in culture require the addition of fetal bovine serum (FBS) as a growth complement to media. FBS is obtained from bovine (cow) serum, and therefore contains large quantities of cow exosome vesicles. These exosomes may interfere with some types of studies, or may lead to unreliable results when studying the exosomes shed from your cells of interest in normal culture conditions. Therefore, the use of exosome-depleted FBS is highly recommended for many types of studies.

Norgen's FBS Exosome Depletion Kits (Slurry Format) constitute an all-in-one system for the depletion of cow's exosomes from FBS prior to using it as a growth supplement in your culture medium. The FBS recovered from the depletion process is exosome-depleted and does not contain any quantifiable bovine miRNAs. Moreover, the exosome-depleted FBS will support the growth of your cells of interest similar to the non-depleted FBS. The depletion is based on Norgen's proprietary resin. These kits provide a clear advantage over other available kits in that they do not require ultracentrifugation, any special instrumentation, precipitation reagents or any protease treatments. More importantly, the depletion process is an inexpensive method for depletion of your own FBS, as compared to the current ready-to-use exosome-depleted media available on the market.

Features and Benefits

- Efficient depletion of cow's exosomes from Fetal Bovine Serum
- Deplete exosome-sized vesicles from versatile FBS volumes of up to 280 mL
- No protease treatment required
- No time-consuming ultracentrifugation
- No precipitation reagents required
- No overnight incubation required
- Depleted FBS has no detectable cow's miRNA
- The depleted FBS provides the same cellular growth rates as the standard FBS
- No contamination with precipitation reagents

Feature	Specifications
Sample Type	Fetal Bovine Serum
Sample Volume Range	Up to 140 mL FBS FBS Exosome Depletion Kit I (Slurry Format) Up to 280 mL FBS FBS Exosome Depletion Kit II (Slurry Format)
Depletion	Depletes exosomes-sized vesicles
Bovine miRNA	No detectable bovine miRNA
Time to Complete 6 Purifications	40 minutes

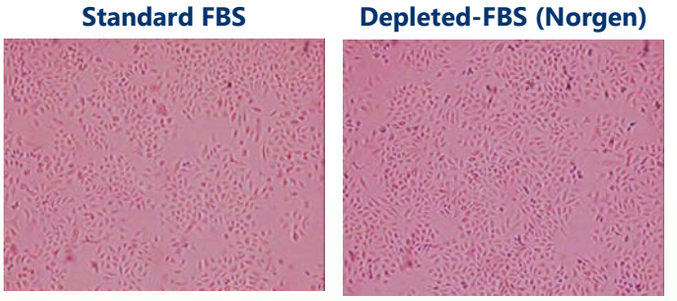


Figure 1. Growth rates of HeLa cells in media containing exosome-depleted FBS. Growth rates of HeLa cells in media containing exosome-depleted FBS using Norgen's FBS Exosome Depletion Kits (Slurry Format) was compared to that in media containing standard FBS. Simply, HeLa cells were seeded in DMEM with either 10% Exosome-depleted FBS using Norgen's kits or 10% standard FBS and then cultured under standard conditions at 37°C with 5% CO_2 for 3 days. The cells were imaged using a Moticam 480 to observe cellular morphology and growth rate. Similar growth and identical cellular morphology were detected for both the Exosome-depleted FBS using Norgen's FBS Exosome Depletion Kits and the standard FBS.

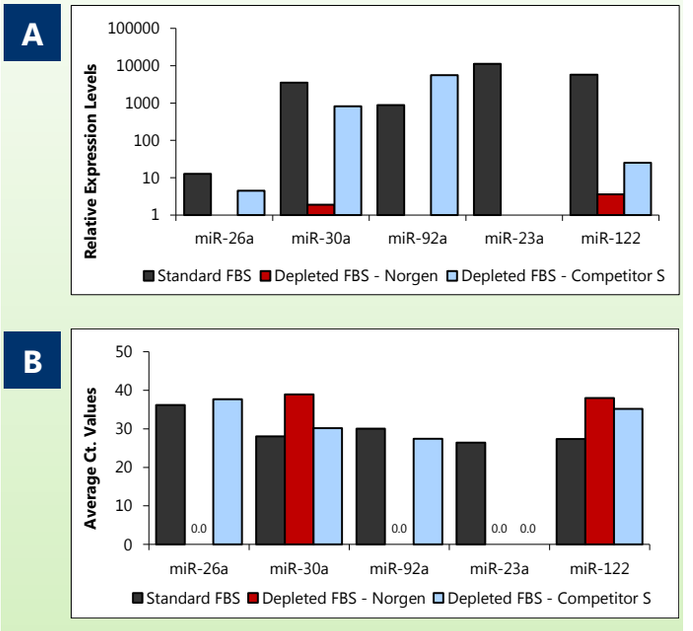


Figure 2. Exosome-depleted FBS with Norgen's FBS Exosome Depletion Kits (Slurry Format) has undetectable Bovine miRNA levels. Norgen's FBS Exosome Depletion Kit I (Slurry Format) (Cat# 61100) was used to deplete bovine miRNA from 5mL FBS. Total RNA/miRNA including exosomal RNA was purified from the depleted FBS, non-depleted FBS and a commercially available ready to go depleted FBS using Norgen's Plasma/Serum Cell-Free Circulating DNA Purification Maxi Kit (Cat# 55800). Five different bovine microRNAs were assessed by RT-qPCR (miR-26a, miR-30a, miR-92a, miR-23a and miR-122). Three out of the five tested miRNA (miR-26a, miR-92a and miR-23a) did not show any amplification in the FBS depleted using Norgen's FBS Exosome Depletion Kit I (Slurry Format) whereas the other two miRNAs (miR-30a and miR-122) showed very late Ct values which appeared to be a primer dimer according to the melt curve.

FBS Exosome Depletion Kit I (Column Format) Cat. # 61200
FBS Exosome Depletion Kit II (Column Format) Cat. # 61300

Rapid and simple depletion of cow's exosomes from fetal bovine serum (column format)

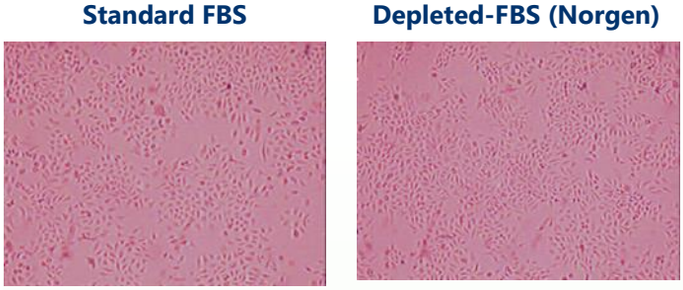
Most culture medium used for the growth and propagation of cells in culture require the addition of fetal bovine serum (FBS) as a growth complement to media. FBS is obtained from bovine (cow) serum, and therefore contains large quantities of cow exosome vesicles. These exosomes may interfere with some types of studies, or may lead to unreliable results when studying the exosomes shed from your cells of interest in normal culture conditions. Therefore, the use of exosome-depleted FBS is highly recommended for many types of studies.

Norgen's FBS Exosome Depletion Kits (Column Format) constitute an all-in-one system for the depletion of cow's exosomes from FBS prior to using it as a growth supplement in your culture medium. The FBS recovered from the depletion process is exosome-depleted and does not contain any quantifiable bovine miRNAs. Moreover, the exosome-depleted FBS will support the growth of your cells of interest similar to the non-depleted FBS. The depletion is based on Norgen's proprietary resin. These kits provide a clear advantage over other available kits in that they do not require ultracentrifugation, any special instrumentation, precipitation reagents or any protease treatments. More importantly, the depletion process is an inexpensive method for depletion of your own FBS, as compared to the current ready-to-use exosome-depleted media available on the market.

Features and Benefits

- Efficient depletion of cow's exosomes from Fetal Bovine Serum
- Deplete exosome-sized vesicles from versatile FBS volumes of up to 240 mL
- No protease treatment nor time-consuming ultracentrifugation required
- No precipitation reagents required
- No overnight incubation required
- Depleted FBS has no detectable cow's miRNA
- The depleted FBS provides the same cellular growth rates as the standard FBS
- No contamination with precipitation reagents

Feature	Specifications
Sample Type	Fetal Bovine Serum
Sample Volume Range	Up to 120 mL FBS FBS Exosome Depletion Kit I (Column Format) Up to 240 mL FBS FBS Exosome Depletion Kit II (Column Format)
Depletion	Depletes exosomes-sized vesicles
Bovine miRNA	No detectable bovine miRNA
Time to Complete 6 Purifications	40 minutes



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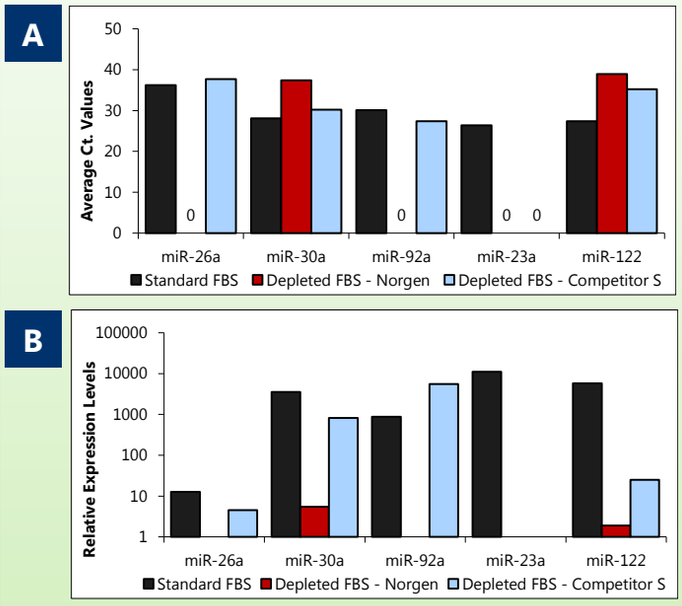

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Commitment to Quality

NORGEN BIOTEK CORP.

3430 Schmon Parkway, Thorold, ON L2V 4Y6 Canada
Phone: (905) 227-8848
Toll Free: 1-866-NORGENB (667-4362)
Fax: (905) 227-1061
email: info@norgenbiotek.com

www.norgenbiotek.com

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