

## Plasma/Serum Exosome Purification Kits

## Product Insert

Product # 57400, 57500, 57600

Exosomes are 40 - 150 nm membrane vesicles which are secreted by most cell types. Exosomes can be found in 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 plasma or serum are 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 being bound to proteins (fc-RNA) are protected from degradation by RNAses, they can be efficiently recovered from biological fluids, such as plasma or serum. 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's Plasma/Serum Exosome Purification Kits constitute an all-in-one system for the purification of exosomes from different plasma/serum sample volumes ranging from 50 µL up 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 kits in that they do not require any special instrumentation, precipitation reagents or any protease treatments. More importantly, the purified exosomes will not be contaminated with any other RNA-bound proteins that may contaminate your exosomal RNA, which is essential if studying Exosomal RNA gene expression.

Kit Descriptions and Components			
	Mini Kit (Cat# 57400) 50 µL - 1 mL	Midi Kit (Cat# 57500) 1 mL - 4 mL	Maxi Kit (Cat# 57600) 4 mL - 10 mL
Number of Preps	50 preps	25 preps	15 preps
Slurry E	14.5 mL	14.5 mL	14.5 mL
ExoC Buffer	8 mL	8 mL	2 x 8 mL
ExoR Buffer	12 mL	12 mL	12 mL
Mini Filter Spin Column	50	25	15
Elution tubes (1.7 mL)	50	25	15
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### Important Notes

- *This kit is suitable for the purification of exosomes from fresh or frozen serum or plasma prepared from blood collected on either EDTA or Citrate. Plasma samples prepared from blood collected on heparin should not be used as heparin can significantly interfere with many downstream applications such as RT-PCR.*
- *Frozen plasma/serum samples should be centrifuged for 2 minutes at 400 x g (~2,000 RPM) before processing. Only clear supernatant should be processed otherwise abundant plasma/serum proteins may interfere with any downstream application.*

### Storage Conditions and Product Stability

All buffers should be kept tightly sealed and stored at room temperature (15-25°C) for up to 2 years without showing any reduction in performance.

## Customer-Supplied Reagents and Equipment

- Disposable powder-free gloves
- Centrifuge with a swinging bucket rotor capable of 2,000 RPM
- Benchtop microcentrifuge
- Micropipettors
- Sterile pipette tips with filters
- 1.5 mL tubes
- 15 mL conical tubes
- 50 mL conical tubes
- Nuclease-Free Water

## General Precautions

The user should exercise the following precautions while using these kits:

- All biological samples should be considered as potentially infectious. Proper biosafety measures should therefore be carried out when using this kit.

## Quality Control

In accordance with Norgen's ISO 9001 and ISO 13485-certified Quality Management System, each lot of Norgen's Plasma/Serum Exosome Purification Kits are tested against predetermined specifications to ensure consistent product quality.

## Product Use Limitations

Norgen's Plasma/Serum Exosome Purification Kits are designed for research purposes only. It is not intended for human or diagnostic use.

## Product Warranty and Satisfaction Guarantee

NORGEN BIOTEK CORPORATION guarantees the performance of all products in the manner described in our product manual. The customer must determine the suitability of the product for its particular use.

## Safety Information

Ensure that a suitable lab coat, disposable gloves and protective goggles are worn when working with chemicals. For more information, please consult the appropriate Material Safety Data Sheets (MSDSs). These are available as convenient PDF files online at [www.norgenbiotek.com](http://www.norgenbiotek.com).

If liquid containing these buffers is spilled, clean with suitable laboratory detergent and water. If the spilled liquid contains potentially infectious agents, clean the affected area first with laboratory detergent and water, and then with 1% (v/v) sodium hypochlorite.

**CAUTION: DO NOT add bleach or acidic solutions directly to the sample-preparation waste.**

## Notes Before Use:

- All centrifugation steps are performed at room temperature.
- Ensure that centrifuge tubes used are capable of withstanding the centrifugal forces required.
- The provided Mini Filter Spin Columns are optimized to be used with a benchtop centrifuges and not to be used on a vacuum apparatus
- Most standard benchtop microcentrifuges will accommodate Norgen's Mini Filter Spin Columns.

## Preparation of Cell-free Plasma/Serum from Frozen Sample

1. Place your frozen Plasma/Serum at 4°C to thaw
2. After thawing your plasma/serum sample, aliquot the volume to be processed and centrifuge for **2 minutes at 400 x g (~2,000 RPM)**
3. After centrifugation, transfer the clear plasma/serum supernatant to a fresh tube

❖ **Cell-Free Plasma/Serum is now ready for Exosome Purification**

Please check the product # and proceed to the appropriate procedure

### Section 1: Plasma/Serum Exosome Purification Mini Kit (Cat. # 57400)

*Note: The procedure outlined below is for a 1 mL input of plasma/serum. If processing a sample volume lower than 1 mL plasma/serum, simply bring the volume of your samples up to 1 mL using Nuclease-free water and proceed as outlined below.*

1. To 1 mL plasma/serum add 3 mL Nuclease-free water, followed by the addition of 100  $\mu$ L of **ExoC Buffer**. (*Note: The final volume of any plasma/serum sample to be processed should be 4 mL before the addition of the specified 100  $\mu$ L of ExoC Buffer*)
2. To the mixture from **Step 1** add 200  $\mu$ L of **Slurry E**. Mix well by vortexing for 10 seconds and let stand at room temperature for 5 minutes. (*Note: Mix Slurry E well prior to use. For optimal performance ensure that resin is completely resuspended.*)
3. Mix well by vortexing for 10 seconds. Centrifuge for **2 minutes at 2,000 RPM**. Discard the supernatant.
4. Apply 200  $\mu$ L **ExoR Buffer** to the slurry pellet and mix well by vortexing for 10 seconds.
5. Incubate the slurry pellet resuspended in the 200  $\mu$ L **ExoR Buffer** at room temperature for 5 minutes.
6. After incubation, mix well by vortexing for 10 seconds, then centrifuge for **2 minute at 500 RPM**.
7. Transfer the supernatant to a Mini Filter Spin column assembled with an elution tube and centrifuge for 1 minute at 6,000 RPM. **Do Not Discard the flowthrough which contains your purified Exosomes.**
  - **Your Exosomes are now ready for any downstream applications.**

### Section 2: Plasma/Serum Exosome Purification Midi Kit (Cat. # 57500)

*Note: The procedure outlined below is for 4 mL inputs of plasma/serum. If processing a sample volume in the range of 1 mL - 4 mL plasma/serum, simply bring the volume of your sample up to 4 mL using Nuclease-free water and proceed as outlined below.*

1. To 4 mL plasma/serum add 12 mL Nuclease-free water, followed by the addition of 300  $\mu$ L of **ExoC Buffer**. (*Note: The final volume of any plasma/serum sample to be processed should be 16 mL before the addition of the specified 300  $\mu$ L of ExoC Buffer*)
2. To the mixture from **Step 1** add 400  $\mu$ L of **Slurry E**. Mix well by vortexing for 10 seconds and let stand at room temperature for 5 minutes. (*Note: Mix Slurry E well prior to use. For optimal performance ensure that resin is completely resuspended.*)
3. Mix well by vortexing for 10 seconds. Centrifuge for **2 minutes at 2,000 RPM**. Discard the supernatant.
4. Apply 400  $\mu$ L **ExoR Buffer** to the slurry pellet and mix well by vortexing for 10 seconds.
5. Incubate the slurry pellet resuspended in the 400  $\mu$ L **ExoR Buffer** at room temperature for 10 minutes.
6. After incubation, mix well by vortexing for 10 seconds then centrifuge for **2 minute at 500 RPM**.
7. Transfer the supernatant to a Mini Filter Spin column assembled with an elution tube and centrifuge for 1 minute at 6,000 RPM. **Do Not Discard the flowthrough which contains your purified Exosomes.**
  - **Your Exosomes are now ready for any downstream applications.**

### Section 3: Plasma/Serum Exosome Purification Maxi Kit (Cat. # 57600)

*Note: The procedure outlined below is for 10 mL inputs of plasma/serum. If processing a sample volume in the range of 4 mL - 10 mL plasma/serum, simply bring the volume of your sample up to 10 mL using Nuclease-free water and proceed as outlined below.*

1. To 10 mL plasma/serum add 30 mL Nuclease-free water, followed by the addition of 1 mL of **ExoC Buffer**. (*Note: The final volume of any plasma/serum sample to be processed should be 40 mL before the addition of the specified 1 mL of ExoC Buffer*)
2. To the mixture from **Step 1** add 600  $\mu$ L of **Slurry E**. Mix well by vortexing for 10 seconds and let stand at room temperature for 10 minutes. (*Note: Mix Slurry E well prior to use. For optimal performance ensure that resin is completely resuspended.*)

3. Mix well by vortexing for 10 seconds. Centrifuge for **2 minutes at 2,000 RPM**. Discard the supernatant.
4. Apply 600  $\mu$ L **ExoR Buffer** to the slurry pellet and mix well by vortexing for 10 seconds.
5. Incubate the slurry pellet resuspended in the 600  $\mu$ L **ExoR Buffer** at room temperature for 15 minutes.
6. After incubation, mix well by vortexing for 10 seconds then centrifuge for **2 minute at 500 RPM**.
7. Transfer the supernatant to a Mini Filter Spin column assembled with an elution tube and centrifuge for 1 minute at 6,000 RPM. **Do Not Discard the flowthrough which contains your purified Exosomes.**
  - **Your Exosomes are now ready for any downstream applications.**

**Norgen's Exosomal RNA Isolation Kit (Cat# 58000) is highly recommended for the isolation of Exosomal RNA from ExoR Buffer.**

## Frequently Asked Questions

1. **What should I do if some of the grey resin is transferred out when I am decanting the plasma/serum supernatant?**
  - Simply remix and recentrifuge. After centrifuging decant the supernatant.
2. **What if I added more or less from Slurry E?**
  - Adding less volume may reduce the amount of the purified exosomes. Adding more may not affect the exosome capture but may affect the release of the purified exosomes in the ExoR Buffer.
3. **What if I added more or less from ExoC Buffer?**
  - Adding a different volume from the specified optimum volume will significantly reduce the amount of the purified exosomes.
4. **What if I added more or less from ExoR Buffer?**
  - Adding less volume will reduce the release of the captured exosomes in the ExoR Buffer. Adding more will not affect the release of the captured exosomes but it will be more diluted.
5. **What will happen if accidentally some of the grey resin was transferred with the ExoR buffer?**
  - Any grey resin will be filtered through the Mini Filter Spin Column and the flowthrough which contains the purified exosomes should not contain any grey resin.

## Technical Assistance

NORGEN's Technical Service Department is staffed by experienced scientists with extensive practical and theoretical expertise in sample and assay technologies and the use of NORGEN products. If you have any questions or experience any difficulties regarding Norgen's Plasma/Serum Exosome Purification Kits or NORGEN products in general, please do not hesitate to contact us.

NORGEN customers are a valuable source of information regarding advanced or specialized uses of our products. This information is helpful to other scientists as well as to the researchers at NORGEN. We therefore encourage you to contact us if you have any suggestions about product performance or new applications and techniques.

For technical assistance and more information, please contact our Technical Support Team between the hours of 8:30 and 5:30 (Eastern Standard Time) at (905) 227-8848 or Toll Free at 1-866-667-4362. or call one of the NORGEN local distributors ([www.norgenbiotek.com](http://www.norgenbiotek.com)) or through email at [techsupport@norgenbiotek.com](mailto:techsupport@norgenbiotek.com).

Norgen's purification technology is patented and/or patent pending. See [www.norgenbiotek.com/patents](http://www.norgenbiotek.com/patents)

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