

**ProteoSpin™ Urine Protein Concentration Micro Kit**  
**Product # 17400****Product Insert**

Urine protein analysis can be used for the identification of potential biomarkers in urine, and to diagnose and/or monitor renal and other diseases. The ProteoSpin™ Urine Protein Concentration Micro Kit provides a fast and simple procedure for concentrating dilute solutions of urine proteins from small volumes of urine. Purification is based on spin column chromatography using Norgen's proprietary resin as an ion exchanger. Urine proteins will bind to the column, while non-specifically bound materials such as salts are easily removed from the sample. The simultaneous removal of salts while concentrating a dilute urine protein solution makes the kit a convenient method for preparing proteins before running downstream proteomic applications including SDS-PAGE, 2D gels, whole protein mass spectrometry, and protein microarrays.

The ProteoSpin™ Urine Protein Concentration Micro Kit contains sufficient materials for 25 preparations. Each spin column is able to concentrate and desalt up to 200 µg of urine proteins. Preparation time for 12 samples is only 20 minutes. The kit has a shelf life of at least 1 year when stored as suggested.

**Kit Components**

Component	Product # 17400 (25 samples)
Wash Solution C	60 mL
Binding Buffer A	4 mL
Elution Buffer C	8 mL
Protein Neutralizer	4 mL
Micro Spin Columns	25
Collection Tubes	25
Elution tubes (1.7 mL)	25
Product Insert	1

**Storage Conditions and Product Stability**

All solutions should be kept tightly sealed and stored at room temperature. Once opened, the solutions should be stored at 4°C. This kit is stable for 2 years after the date of shipment.

**Precautions and Disclaimers**

This kit is designed for research purposes only. It is not intended for human or diagnostic use.

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).

**Customer-Supplied Reagents and Equipment**

- Benchtop microcentrifuge
- Micropipettors
- 1.5 mL microcentrifuge tubes

## Procedure

All centrifugation steps are carried out in a benchtop microcentrifuge at 3,300 x g (~7,000 RPM) except where noted. Please check your microcentrifuge specifications to ensure proper speed. Performance of the kit is not affected by temperature, and thus the procedure may be performed at room temperature, 4°C, or on ice.

### Notes prior to use:

- We recommend the use of **Norgen's Urine Preservative** when collecting urine samples, which is designed for the preservation of nucleic acids and proteins in fresh urine samples at ambient temperatures. The components of the Urine Preservative allow samples to be stored for over 2 years at room temperature with no detected degradation of urine DNA, RNA or proteins. Norgen's Urine Preservative is available in 2 convenient formats: in a liquid format in Norgen's Urine Preservative Single Dose Ampules, as well as in a dried format in Norgen's Urine Collection and Preservation Tubes. Please see the Related Products table below.
- A variable speed centrifuge should be used for maximum kit performance. If variable speed centrifuge is not available a fixed speed centrifuge can be used, however reduced yields may be observed.
- Ensure that all solutions are at room temperature prior to use, and that no precipitates have formed. If necessary, warm the solutions and mix well until the solutions become clear again.

### 1. pH Adjustment of Urine Sample

The most critical step in urine protein sample preparation is the proper pH adjustment of the solution to be applied to the column. Depending on the person's acid-base status, the pH of the urine sample may range from 4.5 to 8. The pH of the urine must be adjusted to the binding pH of 3.5 – 4 in order to concentrate the urine proteins.

- a. Add 40 µL of Binding Buffer A to a 1 mL urine sample.
- b. Mix contents well.
- c. Verify that the pH is 3.5 - 4, and add more Binding Buffer A if necessary.

**Note:** In some concentrated urine samples, precipitation may occur with the addition of the Binding Buffer A. This precipitate includes urine proteins, and thus should not be discarded. The precipitate should be resuspended as much as possible, and loaded onto the column with the rest of the sample.

### 2. Column Activation

- a. Assemble a spin column with a provided collection tube. Open the cap on the column.
- b. Add 500 µL of Wash Solution C to the column and close the cap.
- c. Centrifuge for two minutes at 3,300 x g (~7,000 RPM).
- d. Repeat steps **2b** and **2c** to complete the column activation step.

### 3. Protein Binding

- a. Apply up to 650 µL of the pH-adjusted urine sample onto the column, and centrifuge for two minutes. Inspect the column to ensure that the entire sample has passed through into the collection tube. If necessary, spin for an additional three minutes.

**Note:** If the sample still has not passed into the collection tube after five minutes, the speed may be increased to 6,700 x g (~10,000 RPM) and the column spun for another two minutes.

- b. Discard the flowthrough. Reassemble the spin column with its collection tube.
- c. Repeat steps **3a** and **3b** until the entire protein sample has been loaded onto the column.

**Note:** You can save the flowthrough in a fresh tube for assessing your protein's binding efficiency.

#### 4. Column Wash

- a. Apply 500  $\mu\text{L}$  of Wash Solution C to the column and centrifuge for two minutes.
- b. Discard the flowthrough and reassemble the spin column with its collection tube.
- c. Add another 500  $\mu\text{L}$  of Wash Solution C to the column and centrifuge for two minutes.
- d. Inspect the column to ensure that the liquid has passed through into the collection tube. There should be no liquid in the column. If necessary, spin for an additional minute to dry.

#### 5. Protein Elution and Neutralization

- a. Add 9.3  $\mu\text{L}$  of Protein Neutralizer to a fresh 1.7 mL Elution Tube.
- b. Transfer the spin column from the Column Wash procedure into the Elution Tube.
- c. Apply 100  $\mu\text{L}$  of the Elution Buffer C to the column and centrifuge for two minutes to elute bound proteins.

**Note:** Approximately 90% of bound protein is recovered in the first elution. If desired, a second elution using 100  $\mu\text{L}$  of Elution Buffer C may be carried out. This should be collected into a different tube (to which 9.3  $\mu\text{L}$  of Protein Neutralizer is pre-added) to prevent dilution of the first elution.

Urine proteins are now ready for downstream applications.

Related Products	Product #
ProteoSpin™ Urine Protein Concentration Maxi Kit	21600
Urine DNA Isolation Kit	18100
Urine Collection and Preservation Tubes (50 cc) – 1 tube	18111
Urine Collection and Preservation Tubes (50 cc) – 50 tubes	18113
Urine Collection and Preservation Tubes (15 cc) – 1 tube	18120
Urine Collection and Preservation Tubes (15 cc) – 50 tubes	18122
Urine Collection and Preservation Tubes (5 cc) – 1 tube	18116
Urine Collection and Preservation Tubes (5 cc) – 50 tubes	18118
Urine Preservative Single Dose – 1 tube	18124
Urine Preservative Single Dose – 50 tubes	18126

## Troubleshooting Guide

Problem	Possible Cause	Solution and Explanation
Protein solution does not flow through the column	Centrifugation speed was too low	Check the centrifuge to ensure that it is capable of generating 3,300 x g. Sufficient centrifugal force is required to move the liquid phase through the resin. Centrifugation speeds may be increased to 6,700 x g, but this speed should not be exceeded.
	Inadequate spin time	Spin an additional two minutes to ensure that the liquid is able to flow completely through the column.
Poor protein recovery	Incorrect pH adjustment of urine sample.	Depending on a person's acid-base status, the starting pH of the urine may range from 4.5 to 8. Therefore, it is important that the proper amount of Binding Buffer A be added to the urine sample in order to adjust the pH to 3.5 - 4 prior to loading onto the column.
	Initial volume of sample applied to column was too low.	Ensure that 1 mL of the pH-adjusted urine sample is loaded onto the column in order to capture a large portion of the proteins present in the sample.
Eluted protein is degraded	Eluted protein solution was not neutralized.	Add 9.3 $\mu$ L of Protein Neutralizer to each 100 $\mu$ L of eluted protein in order to adjust the pH to neutral. Some proteins are sensitive to high pH, such as the Elution Buffer C at pH 12.5
	Eluted protein was not neutralized quickly enough.	If eluted proteins are not used immediately, degradation will occur. We strongly suggest adding Protein Neutralizer in order to lower the pH.

### Technical Support

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.

Technical support can also be obtained from our website ([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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