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Introduction

The E.Z.N.A.™ RNA family of products is an innovative system that radically simplifies the extraction and purification of RNA from a variety of sources. The key to this system is that it uses the reversible binding properties of the HiBind® Matrix (a new silica-based material) in combination with the speed of mini-column spin technology, thereby permitting single or multiple simultaneous processing of samples. There is no need for phenol/chloroform extractions, and time-consuming steps such as CsCl gradient ultracentrifugation, and precipitation with isopropanol or LiCL, are eliminated. RNA purified using the E.Z.N.A.™ RNA Purification System is ready for applications such as RT-PCR, Northern blotting, poly A⁺ RNA (mRNA) purification, nuclease protection, and *in vitro* translation.

The E.Z.N.A.™ Plant RNA Kit can purify up to 100 µg of Total RNA from cultured eukaryotic cells, tissue or bacteria. Normally, 10-100 mg of plant tissue, can be processed in a single experiment. Average yields are in the range of 30-60 µg of RNA, and are shown in the table below

Yields obtained with the E.Z.N.A.™ Plant RNA Kit	
<i>Arabidopsis sp</i>	30 µg
Maize Leaves	65 µg
Mustard Leaves	34 µg
Tobacco Leaves	28 µg

Lysis of Cells or Tissue occurs under denaturing conditions by practically inactivating RNases. After the homogenization process, samples are applied to the HiBind® RNA Spin column to which Total RNA binds. Cellular debris, and other contaminants are effectively washed away after a few quick wash steps. High quality RNA is finally eluted in Sterile DEPC-treated Water.

Storage and Stability

All E.Z.N.A.™ Plant RNA Kit components are guaranteed for at least 12 months from the date of purchase when stored at Room Temperature. During shipment a precipitate may have formed in the Buffer RB. Dissolve by warming Buffer to 37°C.

Binding Capacity

Each HiBind® RNA Mini column can bind approximately 100 µg of RNA. Using greater than 100 mg of plant tissue is not recommended.

Kit Contents

Product Number	R6827-00	R6827-01	R6827-02
Purification Times	5 preps	50 preps	200 preps
HiBind® RNA Mini Columns	5	50	200
Omega® Homogenizer Column	5	50	200
2 ml Collection Tubes	15	150	600
Buffer RPL †	5 ml	40 ml	130 ml
Buffer SP	2 ml	10 ml	40 ml
Buffer RB †	5ml	30 ml	110 ml
RNA Wash Buffer I	5 ml	45 ml	175 ml
RNA Wash Buffer II (Concentrate)▲	5 ml	15 ml	50 ml
DEPC-treated Water	1 ml	20 ml	50 ml
Instruction Booklet	1	1	1

▲ RNA Wash Buffer II is supplied as a concentrate and must be diluted with 96-100% ethanol before use in order to obtain a working solution.

† As a preparation step you will need to add 20µl of 2-mercaptoethanol (β-mercaptoethanol) per 1 ml of Buffer RB, and/or per 1 ml of Buffer RPL (depending on protocol; see beginning of protocol). This mixture can be stored for 1 week at room temp **NOTE:** 2-mercaptoethanol is the key in denaturing RNases and must be added before use.

Before Starting

It is strongly advised that you familiarize yourself with the entire booklet before starting. E.Z.N.A.™ Kits are designed to be simple, fast, and reliable provided that all steps are followed diligently.

- Please Remember to always wear latex gloves whenever working with RNA. This will minimize RNase Contamination. Use only clean RNase-free disposable plastic pipette tips when using the supplied reagents.
- During the procedure work CAREFULLY but QUICKLY.
- Under cool ambient conditions, crystals may form in Buffer RB. This is normal; warm at 37°C to dissolve.

- All centrifugation steps must be carried out at room temperature 22°C - 25°C.

Important	Dilute RNA Wash Buffer II with absolute ethanol as follows
	R6827-00 Add 20ml of absolute ethanol per bottle
	R6827-01 Add 60ml of absolute ethanol per bottle
	R6827-02 Add 200ml of absolute ethanol per bottle

E.Z.N.A.™ Plant RNA Protocol I (Standard Protocol)

Equipment supplied by user

- Absolute (~96-100%) Ethanol
- Sterile RNase-free pipet tips and 1.5ml centrifuge tubes
- Microcentrifuge capable of at least 14,000 xg
- 70% ethanol

NOTE: USE EXTREME CAUTION WHEN HANDLING LIQUID NITROGEN

This protocol is suitable for most fresh or frozen tissue samples, thereby allowing efficient recovery of RNA. However, due to the tremendous variation in water, and polysaccharide content in plants, sample size should be limited to ≤100 mg. Best results are obtained with young leaves or needles. The method outlined in this protocol will isolate a sufficient amount of RNA for tracks on a standard Northern assay.

Wearing latex disposable gloves, collect tissue in a 1.5 ml or 2 ml microcentrifuge tube, and freeze by dipping in liquid nitrogen with a pair of tweezers to fill the tube. Grind the tissue using disposable pestles. Disposable Kontes pestles work well and are available for purchase (product no. SSI-1014-39 & SSI-1015-39). Alternatively, one can allow liquid nitrogen to evaporate in order to be able to store the samples for later use (store at -70°C). **DO NOT ALLOW SAMPLES TO THAW.** Use disposable pestle only once. Alternatively, a small clean mortar and pestle can be used. The above methods for disrupting plant tissue, **CANNOT** be replaced with mechanical homogenizers.

Preparation Steps

Have a working solution of Buffer RB/ β -mercaptoethanol ready:

Add 20 μ l β -mercaptoethanol to 1ml of Buffer RB. This mixture can be stored for one week at room temperature

1. **Collect frozen ground plant tissue** (up to 100 mg) **in a microcentrifuge tube** (not supplied), and **IMMEDIATELY add 500 μ l of Buffer RB/ β -mercaptoethanol.** We recommend starting with 50 mg of tissue at first. If results obtained are satisfactory, you may start increasing the amount of starting material. **SAMPLES SHOULD NOT BE ALLOWED TO THAW BEFORE THE ADDITION OF BUFFER RB/ β -mercaptoethanol.** **Vortex VIGOROUSLY to ensure that all clumps are dispersed.** RNA cannot be effectively extracted from clumped tissue.

TIP: As a guide, a 2-cm diameter leaf square weighs approximately 100 mg. Process in sets of four to six tubes. Fill all tubes with liquid nitrogen, grind, and add Buffer RB/ β -mercaptoethanol, and continue to step 2 before starting another set. Centrifuge all tubes simultaneously (step 2 below). We recommend starting with 50 mg of tissue at first to ensure optimal results. Adjust the amount of starting material based on the results obtained.

2. **Transfer the supernatant directly into an Omega® Homogenizer column placed into a 2ml centrifuge tube** (supplied). **Centrifuge at $\geq 14,000 \times g$ for 5 min at room temperature.**
3. **CAREFULLY, transfer the supernatant of the flow-through fraction into a new 1.5ml microcentrifuge tube.** Make sure to not disturb the pellet or transfer any debris. **Add an equal volume of 70% of ethanol, and mix by vortexing at maximum speed for 20 seconds.** If precipitation can be seen at this point, break the precipitation by pipetting up and down 10 times.

TIP: In most cases 450 μ l of supernatant can easily be removed. This will require 450 μ l of 70% ethanol. Note that depending on the sample, the volume of supernatant may vary. After transferring to a fresh tube, measure the volume, and add the correct amount of ethanol.

4. **Apply 700 μ l of the mixture, including and precipitate that may have formed into a HiBind® RNA mini column assembled into a clean 2 ml collection tube** (supplied). **Close the cap GENTLY. Centrifuge at $\geq 12,000 \times g$ for 1 min at room temperature. Discard the flow-through liquid and place the column back into the collection tube. Repeat, by applying the**

remaining mixture to the HiBind® RNA Mini column and centrifuging as above. Discard the flow-through liquid and place the column back into the collection tube.

- **OPTIONAL:** This is the starting point if performing the optional on-column DNase I digestion . Follow protocol as outlined on page 12, after completing step 4 of this protocol.
5. **Add 500 μ l of RNA Wash Buffer I. Close the tube GENTLY. Centrifuge at 10,000 $\times g$ for 30 seconds. Discard both flow-through and collection tube.**
 6. **Place the HiBind® RNA Mini column into a clean 2 ml collection tube** (supplied), and **add 700 μ l of RNA Wash Buffer II diluted with absolute ethanol. Close the column GENTLY. Centrifuge at 10,000 $\times g$ for 30 seconds at room temperature, and discard flow-through. Re-use the collection tube in step 7.**
- NOTE:** RNA Wash Buffer II is supplied as a concentrate and must be diluted with absolute ethanol before use. Refer to bottle label for instructions.
7. **Wash the HiBind® RNA Mini Column a second time by adding 500 μ l of RNA Wash Buffer II. Centrifuge at 10,000 $\times g$ for 30 seconds at room temperature, and discard flow-through.**
 8. Dry the column: **Place the HiBind® RNA Mini Column into the empty collection tube from step 7, and centrifuge at full speed for 2 minutes.** This will completely dry the HiBind® matrix. **DO NOT USE A SPEED GREATER THAN 20,000 $\times g$**
 9. Elute RNA: **Transfer the column into a clean 1.5 ml microfuge tube** (not supplied), and **elute RNA by adding 50-100 μ l of DEPC-treated water** (supplied). Amount of DEPC that you will add will depend on the final RNA concentration desired. A second elution into the same tube may be necessary if your expected RNA yield is >50 μ g.

NOTE: RNA may be eluted with a greater volume of water. While additional elutions do increase total RNA yield, the final concentration will decrease due to more than 80% recovery in the first elution. No RNA extraction procedure can completely remove genomic DNA. For sensitive work (such as RT-PCR or differential display), we suggest that you treat the eluted RNA with RNase-free

DNase(see protocol on page). In addition, we suggest that you use intron-spanning primers (RT-PCR) that allow easy identification of DNA-contamination. A control PCR reaction containing the RNA as a template will also allow detection of DNA contamination. For designing intron-spanning primers, call our technical staff at 1-800-832-8896 for assistance. We can design primers suited to your needs

E.Z.N.A™ Plant RNA Protocol II (for difficult samples)

In certain plant samples RNA isolation can be difficult due to the large amount of polysaccharides, and phenolic compounds commonly found in them. This method outlined below involves a simple and rapid precipitation that will remove much of these compounds. **USE THIS PROTOCOL WHEN THE STANDARD PROTOCOL HAS GIVEN YOU LOWER OR NO YIELDS.**

Preparation Steps

- Have a working solution of Buffer RPL/ β -mercaptoethanol ready. **Add 20 μ l β -mercaptoethanol to 1ml of Buffer RPL.** This mixture can be stored for one week at room temperature
- Have a working solution of Buffer RB/ β -mercaptoethanol ready. **Add 20 μ l β -mercaptoethanol to 1ml of Buffer RB.** This mixture can be stored for one week at room temperature
- **Pre-heat Buffer RB or DEPC Water** (whichever applicable, see step 7 ; Buffer RB is recommended) to 65°C
- **Have a Water Bath set to 65°C** (may be necessary to effectively dissolve RNA)

1. **Grind Plant Tissue as outlined on page 5.**
2. **Collect frozen ground plant tissue** (up to 100 mg) **in a microcentrifuge tube** (not supplied), and **IMMEDIATELY add 600 μ l of Buffer RPL/ β -mercaptoethanol.** We recommend starting with 50 mg of tissue at first. If results obtained are satisfactory, you may start increasing the amount of starting material. **SAMPLES SHOULD NOT BE ALLOWED TO THAW BEFORE THE ADDITION OF BUFFER RPL/ β -mercaptoethanol. Vortex VIGOROUSLY to ensure that all clumps are dispersed.** RNA cannot be effectively extracted from clumped tissue.

TIP: As a guide, a 2-cm diameter leaf square weighs approximately 100 mg. Process in sets of four to six tubes. Fill all tubes with liquid nitrogen, grind, and

add Buffer RPL/ β -mercaptoethanol, and continue to step 3 before starting another set. Centrifuge all tubes simultaneously (step 3 below). We recommend starting with 50 mg of tissue at first to ensure optimal results. Adjust the amount of starting material based on the results obtained.

3. **Add 140 μ l of Buffer SP and vortex thoroughly to mix. Centrifuge at 10,000 x g for 10 min at room temperature.**
4. **CAREFULLY aspirate the cleared lysate into a new microfuge.** Make sure that you do not disturb the pellet or transfer any debris. **Add one volume of isopropanol and vortex to precipitate RNA.** This step removes much of the polysaccharide content, and improves spin-column performance by increasing RNA binding capacity (and therefore yield) in the steps that follow. No incubation is required after the addition of isopropanol.
TIP: In most cases 600 μ l of supernatant can easily be removed. This will require 600 μ l of isopropanol. Note that depending on the sample, the volume of the supernatant will vary. After transferring to a fresh tube, measure the volume, and then add the correct amount of isopropanol
5. **IMMEDIATELY centrifuge at 10,000 x g for 2 min at room temperature to pellet RNA.** A longer centrifugation will not improve yields.
6. **CAREFULLY aspirate or decant the supernatant, while making sure not to dislodge the RNA pellet. Invert the microfuge tube on a paper towel for 1 min in order to allow any residual liquid to drain.** Drying the pellet is not necessary.
7. **Add 100 μ l of RB buffer pre-heated to 65°C or sterile DEPC-treated water pre-heated to 65°C (supplied) and vortex to resuspend the pellet.** A brief incubation at 65°C may be necessary to effectively dissolve RNA.

IMPORTANT: RB buffer is recommended to use in the step for dissolving the RNA pellet, especially when degradation was found after elution. RB contains a strong RNase inhibitor. DEPC-treated water should only be used in cases where dissolving with RB Buffer has been proven difficult.

8. In order to prepare for step 9, adjust binding conditions by following either step a or b below.
 - a: If RB Buffer was used in previous step:
Add 250 μ l of Buffer RB/ β -mercaptoethanol followed by 350 μ l of 70% ethanol. Vortex thoroughly to mix.

- b. If DEPC-treated water was used in previous step:
Add 350µl of Buffer RB/β-mercaptoethanol followed by 250µl of ABSOLUTE ethanol.

9. **Apply the entire sample**, including any precipitates that may have formed into a HiBind® RNA Mini column assembled into a clean 2 ml collection tube (supplied). **Centrifuge at 10,000 x g for 30 sec at room temperature. Discard flow-through liquid, and place the column back into the collection tube.**

→ **OPTIONAL:** This is the starting point if performing the optional on-column DNase I digestion. Follow protocol as outlined on page 12, after completing step 9 of this protocol

10. **Add 500µl of RNA Wash Buffer I and centrifuge at 10,000 x g for 30 sec. Discard both flow-through liquid and collecting tube.**

11. **Place the HiBind® RNA Mini column into a clean 2 ml collection tube (supplied), and add 500µl of RNA Wash Buffer II diluted with absolute ethanol. Close the column GENTLY. Centrifuge at 10,000 x g for 30 seconds at room temperature, and discard flow-through. Re-use the collection tube in step 12.**

NOTE: RNA Wash Buffer II is supplied as a concentrate and must be diluted with absolute ethanol before use. Refer to bottle label for instructions.

12. **Wash the HiBind® RNA Mini Column with a second 500µl of RNA Wash Buffer II. Centrifuge at 10,000 x g for 30 seconds at room temperature, and discard flow-through.**

13. Dry the column: **Place the HiBind® RNA Mini Column into the empty collection tube from step 12, and centrifuge at full speed for 1 minute.** This will completely dry the HiBind® matrix. **DO NOT USE A SPEED GREATER THAN 20,000 x g**

14. Elute RNA: **Transfer the column into a clean 1.5 ml microfuge tube (not supplied), and elute RNA by adding 50-100µl of DEPC-treated water (supplied).** Make sure that you add water directly onto the column matrix. Amount of DEPC that you will add will depend on the final RNA concentration desired. A second elution into the same tube may be necessary if your expected RNA yield is >50µg.

NOTE: RNA may be eluted with a greater volume of water. While additional elutions do increase total RNA yield, the final concentration will decrease due

to more than 80% recovery in the first elution. No RNA extraction procedure can completely remove genomic DNA. For sensitive work (such as RT-PCR or differential display), we suggest that you treat the eluted RNA with RNase-free DNase (see protocol on page). In addition, we suggest that you use intron-spanning primers (RT-PCR) that allow easy identification of DNA-contamination. A control PCR reaction containing the RNA as a template will also allow detection of DNA contamination. For designing intron-spanning primers, call our technical staff at 1-800-832-8896 for assistance. We can design primers suited to your needs

RNA Isolation from Arthropods

The exoskeleton of arthropods poses the same problems that many plant specimens do. Pigments and polysaccharides often co-purify with nucleic acids, and interfere with downstream applications.

Preparation Steps

- Have a working solution of Buffer RB/β-mercaptoethanol ready: **Add 20µl β-mercaptoethanol to 1ml of Buffer RB.** This mixture can be stored for one week at room temperature
1. **Freeze and grind up to 100 mg of arthropod tissue under liquid nitrogen. Grind tissue completely to obtain a fine homogenous powder.**
 2. **IMMEDIATELY add 500µl of Buffer RB/β-mercaptoethanol.** Samples should not be allowed to thaw before Buffer RB/β-mercaptoethanol is added. **Vortex vigorously to make sure that all clumps are dispersed.** RNA cannot be effectively extracted from clumped tissue.
 3. Proceed with the Plant RNA Protocol beginning with step 2 of the standard protocol.

RNA Isolation from Fungi

The E.Z.N.A.™ Plant RNA Kit can also be used for Fungal RNA isolation, since many fungal samples possess similar cellular attributes to plant specimens.

Preparation Step:

- Have a working solution of Buffer RB/β-mercaptoethanol ready: **Add 20µl β-mercaptoethanol to 1ml of Buffer RB.** This mixture can be stored for one week at room temperature
1. **Freeze and grind up to 30 mg of fungal sample with liquid nitrogen. Grind tissue completely to obtain a fine homogenous powder.**
 2. **IMMEDIATELY add 500µl of Buffer RB/β-mercaptoethanol.** Samples should

not be allowed to thaw before Buffer RB/ β -mercaptoethanol is added. **Vortex vigorously to make sure that all clumps are dispersed.** RNA cannot be effectively extracted from clumped tissue.

- Proceed with the Plant RNA Protocol beginning with step 2 of the standard protocol.

Optional: DNase I Digestion Protocol

Omega Bio-tek, Inc.'s RNase-Free DNase Set (product no. E1091), provides efficient on-column digestion of DNA during RNA Isolation.

Important to Note:

For most downstream applications it is not necessary to do DNase digestion due to HiBind® RNA resin and spin column technology removing nearly all DNA without the need for DNase Treatment. However, certain sensitive RNA applications might require further removal of DNA. In such case, we recommend that you please follow the outlined steps below using product E1091.

NOTE:After completing steps 1-5 of the standard protocol (making sure that all of your samples have completely passed through the HiBind® RNA column), proceed with the following steps.

- Add 350 μ l of RNA Wash Buffer I. Close the tube GENTLY. Centrifuge at 10,000 xg for 30 seconds. Discard both flow-through and collection tube
- For each HiBind® RNA column, prepare the DNase I stock solution as follows:

E.Z.N.A.™ DNase I Digestion Buffer	73.5 μl
RNase-free DNase I (20 Kunitz/μl)	1.5 μl
Total Volume	75 μl

NOTE:

- DNase I is very sensitive to physical denaturation, therefore do not vortex this DNase I mixture. Please mix by GENTLY inverting the tube. Remember to freshly prepare your DNase I stock solution right before RNA isolation.
- E.Z.N.A.™ DNase I Digestion Buffer is supplied with Omega Bio-Tek, Inc.'s RNase-Free DNase Set (product no. E1091). Standard DNase Buffers are not

compatible with on-membrane DNase digestion. The use of other buffers may affect the binding of RNA to the HiBind® matrix, reducing RNA yields, and purity.

- Pipet 75 μ l of the DNase I stock solution directly onto the surface of the HiBind® RNA resin in each column** (each column should be placed into a 2ml centrifuge tube). Make sure to pipet the stock solution directly onto the membrane. DNase I Digestion will not go through completion if some of the stock solution remains stuck to the wall or the o-ring of the HiBind® RNA column.
- Incubate at room temperature (25-30°C) for 15 minutes.**
- Place the HiBind® RNA column into a new 2 ml centrifuge tube, and add 350 μ l of RNA Wash Buffer I. Incubate at room temperature for 5 minutes. Centrifuge at 10,000 x g for 1 minute and discard flow-through.** Reuse the collection tube in step 5.
- Place the HiBind® RNA column in the same 2 ml centrifuge tube, and add 500 μ l of RNA Wash Buffer II diluted with absolute ethanol. Centrifuge at 10,000 x g for 1 minute and discard flow-through.** Reuse the collection tube in step 6.
- Wash the column with a second 500 μ l of RNA Wash Buffer II diluted with absolute ethanol. Centrifuge and discard flow-through.** Then, with the empty collection tube, **centrifuge the HiBind® matrix for 1 minute at maximum speed to completely dry the HiBind® matrix.**
- Place the column in a clean 1.5 ml microcentrifuge tube (not supplied), and add 50-100 μ l of DEPC-treated water (supplied).** Make sure to add water directly onto the HiBind® matrix. **Centrifuge for 1 minute at full speed to elute the RNA.** A second elution may be necessary if the expected yield of RNA > 50 μ g.

Alternatively, RNA may be eluted with a greater volume of water. While additional elutions increase RNA yield, the concentration will be lower since more than 80% of RNA has been recovered in the first elution. Pre-heating the water to 70°C before adding it to the column, and incubating the column for 5 min at room temperature before centrifugation may increase yields.

Storage of RNA

Purified RNA can be stored at -20° C or -70° C (RNase-free water). Under such conditions RNA prepared with the E.Z.N.A.™ Plant RNA Kit is stable for more than a year.

Quantification of RNA

To determine the concentration and purity of RNA, one should measure the absorbance at 260 nm and 280 nm in a spectrophotometer. 1 O.D. unit measured at 260 nm corresponds to 40µg of RNA per ml. DEPC treated water is slightly acidic and can dramatically lower absorbance values. We suggest that you dilute the sample in a buffered solution (TE) for spectrophotometric analysis. The A_{260}/A_{280} ratio of pure nucleic acids is 2.0, while for pure protein is approximately 0.6. Therefore, a ratio of 1.8-2.0 corresponds to 90-100% pure nucleic acid. [Phenol has a maximum absorbance at 275 nm and can interfere with absorbance readings of DNA or RNA. However, the E.Z.N.A.™ Plant RNA Kit eliminates the use of phenol and avoids this problem.]

RNA Quality

It is highly recommended that RNA Quality be determined prior to all analysis. The quality of RNA can be best assessed by denaturing agarose gel electrophoresis and ethidium bromide staining. Two sharp bands should appear on the gel. These are the 28S and the 18S (23S and 16S for bacteria) ribosomal RNA bands. If these band appears as a smear towards lower molecular weight sized RNAs, the it is likely that your RNA has undergone major degradation during preparation, handling, or storage. Although RNA molecules less than 200 bases in length do not efficiently bind to the HiBind® matrix, a third RNA band, the tRNA band, may be visible when a large number of cells are used.

Troubleshooting Guide

Problem	Cause	Suggestion
Little or no RNA eluted	RNA remains on the column	<ul style="list-style-type: none"> Repeat elution. Pre-heat DEPC-water to 70° C prior to elution. Incubate column for 10 min with water prior to centrifugation.
	Column is overloaded	<ul style="list-style-type: none"> Reduce quantity of starting material.
Clogged column	Incomplete homogenization	<ul style="list-style-type: none"> Completely homogenize sample. Increase centrifugation time. Reduce amount of starting material
Degraded RNA	Source	<ul style="list-style-type: none"> Freeze starting material quickly in liquid nitrogen Do not store tissue culture cells prior to extraction unless they are lysed first. Follow protocol closely, and work quickly.
	RNase contamination	<ul style="list-style-type: none"> Ensure not to introduce RNase during the procedure. Check buffers for RNase contamination.
Problem in downstream applications	Salt carry-over during elution	<ul style="list-style-type: none"> Ensure Wash Buffer II Concentrate has been diluted with 4 v volumes of 100% ethanol as indicated on bottle. 1 X Wash Buffer II must be stored and used at room temperature. Repeat wash with RNA Wash Buffer II.
DNA contamination		<ul style="list-style-type: none"> Digest with RNase-free DNase and inactivate at 75°C for 5 min.
Low Abs ratios	RNA diluted in acidic buffer or water	<ul style="list-style-type: none"> DEPC-treated water is acidic and can dramatically lower Abs₂₆₀ values. Use TE buffer to dilute RNA prior to spectrophotometric analysis.

Ordering Guide

Product	Size	Product No.
Buffer RPL	100ml	PR027
Buffer SP	60ml	PR029
Buffer RB	100ml	PR026
RNA Wash Buffer I	100ml	PR030
RNA Wash Buffer II	25 ml Concentrate	PR031
DEPC Water	100ml	PR032
2ml capless collection tubes	500/BAG	SS1-1370-00
1.5ml DNase/RNase Free	500/BAG	SS1-1210-00
RNase-free DNase Set	50 preps	E1091
Omega® Homogenizer	200/BAG	HCR 003

Please Call, Fax , or e-mail us to place an order.

Tel: 770-931-8400 (US)

Fax: 770-931-0230 (US)

Tel: 1-800-832-8896 (Toll free)

Fax: 1-888-624-1688 (Toll free)

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