



ZYMO RESEARCH

*The Beauty of Science is to Make Things Simple*

# INSTRUCTION MANUAL

## Mini RNA Isolation I Kit™

Catalog Nos. R1005 & R1006

### Contents

I. General Information.....	1, 2
Description	
Highlights	
Specifications	
Product Contents	
Ordering Information	
II. Protocol.....	3, 4
III. List of Products.....	5

For Laboratory Use Only

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ZYMO RESEARCH CORP.

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## I. General Information

### Description

Zymo Research's **Mini RNA Isolation I Kit™** provides a hassle-free method for the rapid isolation of high-quality total RNA from small amounts of cells from culture, needle biopsy, micro-dissected tissue, etc. The procedure combines a unique, single-step RNA extraction/binding buffer with Fast-Spin column technology to yield high quality RNA in less than an hour. The **Mini RNA Isolation I Kit™** allows for the efficient isolation of total RNA from  $1 \times 10^1$ - $1 \times 10^5$  cells. The method is easy: simply add the provided **RNA Extraction Buffer** to extract total RNA from cells of interest then isolate the RNA using the provided **Zymo-Spin™ Columns**. The result is highly-concentrated RNA that is suitable for subsequent RNA-based analyses.

### Highlights

- Allows for the isolation of total RNA from a wide range of cell types using Fast-Spin column technology.
- Simply and reliably isolates total RNA from small sample amounts ( $1 \times 10^1$ - $1 \times 10^5$  cells).
- Column design allows RNA to be eluted at high concentrations into minimal volumes of solvent.
- Eluted RNA is suitable for use in RNA-based procedures.
- Omits the use of organic denaturants as well as proteinases.

### Specifications

- **RNA Purity** – Generally, traces of DNA are present in the eluted RNA fraction. DNA-free RNA can be achieved with subsequent use of Zymo Research's **DNA-Free RNA Kit™** (R1013, R1014, R1027, & R1028).
- **RNA Recovery** – Typically, RNA is eluted into as little as 6-10  $\mu$ l elution buffer allowing for a highly concentrated sample. Columns have a 5  $\mu$ g binding capacity.
- **RNA Storage** – Recommended that 1 U/10  $\mu$ l RNase inhibitor be added to the RNA prior to storage at  $-70^\circ\text{C}$ .
- **Sample Sources** – Cells from culture, needle biopsy, or small amounts of solid tissue.
- **Sample Size** –  $1 \times 10^1$ - $1 \times 10^5$  cells in suspension or solid form.
- **Stability of Product Reagents** – Integrity of kit components is guaranteed for up to one year from date of purchase.
- **Quality Control** – Reagents are routinely tested on a lot-to-lot basis to ensure they provide maximal performance and reliability.

**Note:** For samples containing  $1 \times 10^2$  to  $5 \times 10^6$  cells in suspension or solid form, use the **Mini RNA Isolation II Kit™** (R1030, R1031, R1032, or R1033).

**Note:** Satisfaction of all Zymo Research products is guaranteed. If you should be dissatisfied with this product please call 1-888-882-9682.

## Product Contents

Mini RNA Isolation I Kit™	R1005, R1006 Amount	Storage Temperature
RNA Extraction Buffer	12 ml	Room Temp.
RNA Wash Buffer*	6 ml	Room Temp.
RNA Elution Buffer	1 ml	Room Temp.
Zymo-Spin™ Columns	50 ct.	Room Temp.
Collection Tubes	50 ct.	Room Temp.
Instruction Manual	1	-

\* Ethanol must be added prior to use as indicated on **RNA Wash Buffer** label.

## Ordering Information

Product Description	Catalog No.	Kit Size
Mini RNA Isolation Kit™ supplied w/ uncapped columns	R1005	50 preps.
Mini RNA Isolation Kit™ supplied w/ capped columns	R1006	50 preps.

For Individual Sale	Catalog No.	Amount
RNA Extraction Buffer	R1003-2-3	3 ml
	R1003-2-12	12 ml
	R1003-2-50	50 ml
	R1003-2-100	100 ml
RNA Wash Buffer (concentrate)	R1003-3-2.4	2.4 ml
	R1003-3-6	6 ml
	R1003-3-12	12 ml
	R1003-3-24	24 ml
RNA Elution Buffer	R1003-3-48	48 ml
	R1003-4-1	1 ml
Zymo-Spin I™ Columns (uncapped)	C1003-50	50 ct.
	C1003-250	250 ct.
Zymo-Spin IC™ Columns (capped)	C1004-50	50 ct.
	C1004-250	250 ct.
Collection Tubes	C1001-50	50 ct.
	C1001-500	500 ct.
	C1001-1000	1,000 ct.

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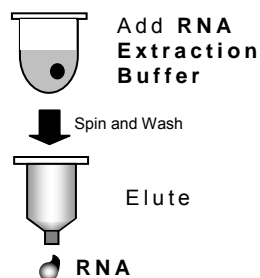
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## II. Protocol

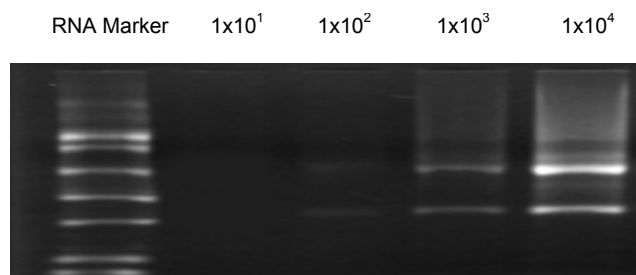
### Overview

The **Mini RNA Isolation I Kit™** employs a single buffer system that allows for cell lysis and RNA extraction then adsorption onto the matrix of a **Zymo-Spin™ Column**. The RNA is washed twice then eluted with **RNA Elution Buffer**. The entire procedure typically takes less than an hour.

For **Technical Assistance** contact those at **Zymo Research's Technical Department** at 1-888-882-9682 or E-mail to [tech@zymoresearch.com](mailto:tech@zymoresearch.com).



Mini RNA Isolation Procedure



Total cellular RNA isolated from  $1 \times 10^1$  to  $1 \times 10^4$  cells using the **Mini RNA Isolation I Kit™**.

### Reagent Preparation

- Before starting, add 24 ml 100% ethanol to the 6 ml **RNA Wash Buffer** concentrate to obtain the final **RNA Wash Buffer** solution.
- Make sure guidelines are followed to ensure the RNA isolation procedure is performed in an RNase-free environment.

**Note:** Alternatively, add 26 ml 95% ethanol to the 6 ml size of wash buffer concentrate.

## Method

### 1. Cell Homogenization

- A. For cell samples:** Isolate cells by gentle centrifugation (approx. 2,000 rpm, 400 x *g*) for 5 minutes and remove the supernatant completely. Add 200  $\mu$ l **RNA Extraction Buffer** to the cell pellet. Resuspend the cells gently by vortexing.
  - B. For tissue samples:** Add 200  $\mu$ l of **RNA Extraction Buffer** directly to the sample and homogenize using a small tissue homogenizer (e.g., Dounce, glass-teflon, etc.).
2. Incubate the lysate on ice for 20 minutes with brief vortexing every 10 minutes.
  3. Add one volume (200  $\mu$ l) 95-100% ethanol to the lysate. Mix briefly and then incubate on ice for 10 minutes.
  4. Transfer the mixture to a **Zymo-Spin™ Column** in a supplied **Collection Tube**.
  5. Spin in a microcentrifuge at  $\geq 10,000$  rpm for 1 minute and discard flow-through.
  6. Add 200  $\mu$ l **RNA Wash Buffer** to the column. Centrifuge at  $\geq 10,000$  rpm for 1 minute. Discard the flow-through.
  7. Repeat step 6.
  8. Transfer the column to an RNase-free 1.5 ml microcentrifuge tube.
  9. Add 10  $\mu$ l **RNA Elution Buffer** directly to the membrane of the column. After 2 minutes, centrifuge at  $\geq 10,000$  rpm for 1 minute to elute the RNA. The eluted RNA can be used immediately or stored at  $-70^{\circ}\text{C}$  for future use.

**Note:** The kit is designed for efficient isolation of total RNA from  $1 \times 10^1$  to  $1 \times 10^5$  cells. Increasing the number of cells processed in any one prep will not lead to increased yields of RNA.

**Note:** If RNA will be quantitated using a spectrophotometer (Abs. 260-280 nm), use RNase-free water to elute RNA from the column.

Note - ™ Trademarks of Zymo Research Corporation. This product is for research use only and should only be used by trained professionals. Some reagents included with this kit are chaotropic and are irritants. Wear protective gloves and eye protection. Follow the safety guidelines and rules enacted by your research institution or facility.

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## Popular RNA Purification & Isolation Products from Zymo

Product	Description	Kit Size	Cat No. (Column Format)
<b>Pinpoint Slide RNA Isolation System I™</b>	Isolation of total RNA from targeted tissue areas on a microscope slide of fresh or frozen tissue sections. Perfect for RNA isolation from clinical tissue samples.	50 Preps	<b>R1003</b>
<b>Pinpoint Slide RNA Isolation System II™</b>	Isolation of total RNA from targeted tissue areas on a microscope slide of paraffin embedded tissue sections. Perfect for RNA isolation from clinical tissue samples.	50 Preps	<b>R1007</b>
<b>Mini RNA Isolation I Kit™</b>	Isolation of trace amounts of RNA from $1 \times 10^1$ to $1 \times 10^5$ cells. Available in both capped and uncapped column formats.	50 Preps 50 Preps	<b>R1005</b> (Uncapped) <b>R1006</b> (Capped)
<b>Mini RNA Isolation II Kit™</b>	Isolation of RNA from $10^2$ to $5 \times 10^6$ cells. Available in both capped and uncapped column formats.	50 Preps 200 Preps 50 Preps 200 Preps	<b>R1030</b> (Capped) <b>R1031</b> (Capped) <b>R1032</b> (Uncapped) <b>R1033</b> (Uncapped)
<b>ZR Whole Blood Total RNA Kit™</b>	Isolation of RNA from whole blood samples in 15 minutes.	50 Preps 100 Preps	<b>R1020</b> <b>R1021</b>
<b>ZR Viral RNA Kit™</b>	Isolation of viral RNA from cell-free body fluids or sample mixtures containing cells at a concentration less than $10^5$ cells per ml.	50 Preps 200 Preps	<b>R1034</b> <b>R1035</b>
<b>ZR-96 Viral RNA Kit™</b>	High-output isolation of viral RNA from cell-free body fluids or sample mixtures containing cells at a concentration less than $10^5$ cells per ml.	2x96 Preps 4x96 Preps	<b>R1040</b> <b>R1041</b>
<b>Urine RNA Kit™</b>	Isolation of total RNA from urine sediment samples. The system employs a unique urine filter to collect cells via a simple syringe "push-through" method.	20 Preps 50 Preps	<b>R1038</b> <b>R1039</b>
<b>RNA Clean-up Kit-5™</b>	Clean and concentrate 5 µg RNA from any reaction in 2 minutes. 8 µl minimal elution volume. Available in capped and uncapped column format.	50 Preps 200 Preps 50 Preps 200 Preps	<b>R1015</b> (Capped) <b>R1016</b> (Capped) <b>R1023</b> (Uncapped) <b>R1024</b> (Uncapped)
<b>RNA Clean-up Kit-25™</b>	Clean and concentrate up to 25 µg RNA from any reaction in 2 minutes. 50 µl minimal elution volume. Available in capped and uncapped column format.	50 Preps 200 Preps 50 Preps 200 Preps	<b>R1017</b> (Capped) <b>R1018</b> (Capped) <b>R1025</b> (Uncapped) <b>R1026</b> (Uncapped)
<b>DNA Free RNA Kit™</b>	Efficiently removes DNA from RNA preparations for RT-PCR reactions in 15 minutes. Available in capped and uncapped column format.	50 Preps 200 Preps 50 Preps 200 Preps	<b>R1013</b> (Capped) <b>R1014</b> (Capped) <b>R1027</b> (Uncapped) <b>R1028</b> (Uncapped)
<b>Zymoclean Gel RNA Recovery Kit™</b>	Isolation of RNA from agarose gels in 15 minutes. 8 µl minimal elution volume for maximum concentration of RNA.	50 Preps	<b>R1011</b>
<b>YeaStar RNA Kit™</b>	Isolation of RNA from a broad spectrum of fungi susceptible to yeast lytic enzyme lysis.	40 Preps	<b>R1001</b>