

# Ambion<sup>®</sup> Cells-to-Ct™ Kits

## Comparison to Traditional RNA Extraction Methods



### Green Benefits

- Less use of hazardous materials
- Less hazardous waste disposal
- Less use of plastic consumables
- Less plastic waste disposal

### Introduction

Life Technologies is committed to designing products with the environment in mind—it's one more step toward a smaller footprint. This fact sheet provides the rationale behind the environmental claims that use of this product results in reduced exposure to hazardous material and generates less waste than comparable products. The use of Ambion<sup>®</sup> Cells-to-Ct™ kits eliminates the need to use hazardous solvents and requires far less plastic consumables from sample preparation to final analysis.

### Product Description

Ambion<sup>®</sup> Cells-to-Ct™ kits include reagents and enzyme mixtures for reverse transcription (RT) and real-time PCR directly from cultured cell lysates, without the need for a separate RNA isolation step.

### Green Features

#### Less Hazardous

Traditional RNA extraction protocols require clean-up with the use of hazardous reagents such as:

- Ethanol—highly flammable and causes systemic toxicity

- Mercaptoethanol—may be fatal when absorbed through the skin
- Guanidine thiocyanate—causes irritation and is harmful if swallowed or inhaled
- Guanidine hydrochloride—causes irritation and is harmful if swallowed or inhaled

The use of Cells-to-Ct™ systems eliminates the need to use any of the hazardous solvents mentioned above.

Please review the MSDS for the Cells-to-Ct™ kits at <http://www3.appliedbiosystems.com/sup/msds/search.htm>

### Less Waste

Traditional methodologies for RNA extraction require multiple steps for RNA extraction and clean-up, requiring the use of multiple disposable tubes, vials, pipettes, and pipette tips. Cells-to-Ct™ kits require fewer plastic consumables than traditional technologies (Figure 1). A comparison of Cells-to-Ct™ kits with traditional technology showed that 139 g of plastic waste (tubes, pipettes, pipette tips) was generated with traditional RNA extraction, compared to 7 g for Cells-to-Ct™ kits (Table 1).

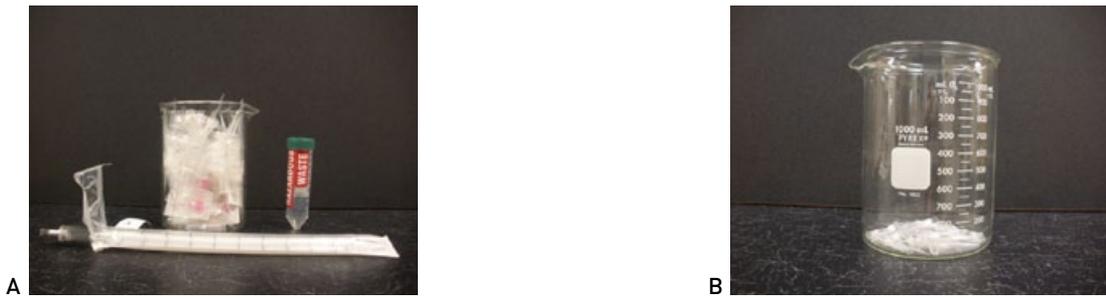


Figure 1. Comparison of Plastic Waste Generated Using Traditional RNA Extraction Methods (A) vs. Cells-to-Ct™ Kits (B).

Table 1. Comparison of the Amount of Waste Generated Using Traditional RNA Extraction Methods vs. Cells-to-Ct™ Kits.

Traditional RNA extraction methods					Cells-to-Ct™ kits				
Step in procedure	Plastic description	# Used	Piece weight (g)	Total mass (g)	Step in procedure	Plastic description	# Used	Piece weight (g)	Total mass (g)
Add 100% ethanol to RPE	50 mL tip	1	20.75	20.75	Tube for lysis mix	1.5 mL tube	1	1.00	1.00
Add B-ME to RLT	1 mL tip	1	0.85	0.85	Add lysis mix to tube	1 mL tip	1	0.85	0.85
Tube for hazardous waste	50 mL tube	1	12.54	12.54	Add DNase to tube	20 µL tip	1	0.18	0.18
Add 350 µL RLT to samples	1 mL tip	10	0.85	8.50	Add lysis solution to samples, mix	200 µL tip	10	0.28	2.80
Add 70% ethanol to samples	1 mL tip	10	0.85	8.50	Add stop solution to samples, mix	20 µL tip	10	0.18	1.80
Add 500 µL RPE to samples	1 mL tip	10	0.85	8.50	<b>Total used</b>		<b>23</b>		<b>6.63</b>
Add another 500 µL RPE	1 mL tip	10	0.85	8.50					
Tubes for samples	1.5 mL tube	10	1.00	10.00					
Add water to elute	200 µL tip	10	0.28	2.80					
Add water to elute again	200 µL tip	10	0.28	2.80					
gDNA eliminator columns	column, tube	10	1.65	16.50					
RNeasy (Qiagen) spin columns	column, tube	10	2.93	29.30					
2 mL collection tubes	Tube	10	1.00	10.00					
<b>Total used</b>		<b>103</b>		<b>139.54</b>	<b>Waste reduction</b>				<b>95.2%</b>

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