ambion® by life technologies™

Ambion® Stabilized Blood-to-Ct™ Nucleic Acid Preparation Kits

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 our 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 comparative products. Using Ambion® Stabilized Blood-to-Ct™ Nucleic Acid Preparation Kits, as opposed to traditional RNA extraction methods, eliminates the need to use hazardous solvents—and requires far less plastic consumables from sample preparation to final analysis.

Product Description

Ambion® Stabilized Blood-to-Ct™ Nucleic Acid Preparation Kits include reagents and enzyme mixtures for preparing reverse transcription (RT) and real-time PCR ready RNA directly from stabilized blood, without the need for a separate RNA isolation step.

Green Features

Less Hazardous

Traditional RNA extraction protocols require cleanup using 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

Using Stabilized Blood-to-Ct™ systems eliminates the need to use any of these hazardous solvents mentioned.

Please review the MSDSs for the Stabilized Blood-to-Ct™ Kits at http://www3.appliedbiosystems.com/sup/msds/search.htm or http://www.invitrogen.com/site/us/en/home/support.html

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. Stabilized Blood-to-Ct™ Kits require fewer plastic consumables than traditional technologies (Figure 1). A comparison of Stabilized Blood-to-Ct™ Kits with traditional technology showed that 87 g of plastic waste (tubes, pipettes, pipette tips) was generated with traditional RNA extraction as compared to 9 g for Stabilized Blood-to-Ct™ Kits (Table 1).

Table 1: Comparison of the amount of waste generated using traditional RNA extraction methods compared to Stabilized Blood-to-CT™ Kits.

Traditional Blood RNA Extraction Methods				
Step in procedure	**Plastic description**	**# Used**	**Piece weight (g)**	**Total mass (g)**
Add 100% ethanol to Buffer BR4	50 ml pipette	1	20.75	20.75
Prepare DNase I stock solution	1 ml tip	1	0.85	0.85
Aliquot DNase I solution	200 ul tip	5	0.28	1.40
Remove supernatant	10 ml pipette	1	9.74	9.74
Use fresh Hemogard closure	Hemogard closure	1	2.62	2.62
Add 4 ml water	5 ml pipette	1	8.98	8.98
Remove supernatant	5 ml pipet	1	8.98	8.98
Discard Blood RNA tube	Blood RNA tube	1	9.44	9.44
Add 350 ul BR1	1 ml tip	1	0.85	0.85
Add 300 ul BR2	1 ml tip	1	1.00	1.00
Add 40 ul proteinase K	200 ul tip	1	0.28	0.28
Discard 1.5 ml microfuge tube	1.5 ml tube	1	1.00	1.00
Transfer sample to Shredder column	1 ml tip	1	1.00	1.00
Discard Shredder column	1 column, tube	1	2.93	2.93
Add 350 ul ethanol	1 ml tip	1	1.00	1.00
Pipet sample to spin column twice	1 ml tip	2	1.00	2.00
Discard 1.5 ml microfuge tube	1.5 ml tube	1	1.00	1.00
Discard 2 ml collection tube	1 tube	2	1.00	2.00
Pipet 350 ul BR3	1 ml tip	1	1.00	1.00
Pipet RDD into 1.5 ml tube	200 ul tip	1	0.28	0.28
Add DNase I stock to RDD	10 ul tip	1	0.18	0.18
Add DNase I/RDD to column	200 ul tip	1	0.28	0.28
Discard 1.5 ml microfuge tube	1.5 ml tube	1	1.00	1.00
Pipet 350 ul BR3	1 ml tip	1	1.00	1.00
Pipet 500 ul BR4 (twice)	1 ml tip	2	1.00	2.00
Discard 2 ml collection tube	1 tube	2	1.00	2.00
Pipet 40 ul BR5	200 ul tip	1	0.28	0.28
Discard spin column	Column, tube	1	2.93	2.93
Add 100% ethanol to Buffer BR4	50 ml pipette	1	20.75	20.75
Prepare DNase I stock solution	1 ml tip	1	0.85	0.85
Aliquot DNase I solution	200 ul tip	5	0.28	1.40
Remove supernatant	10 ml pipette	1	9.74	9.74
Use fresh Hemogard closure	Hemogard closure	1	2.62	2.62
Add 4 ml water	5 ml pipette	1	8.98	8.98
Remove supernatant	5 ml pipette	1	8.98	8.98
Discard Blood RNA tube	Blood RNA tube	1	9.44	9.44
Add 350 ul BR1	1 ml tip	1	0.85	0.85
Add 300 ul BR2	1 ml tip	1	1.00	1.00
Add 40 ul proteinase K	200 ul tip	1	0.28	0.28
Discard 1.5 ml microfuge tube	1.5 ml tube	1	1.00	1.00
Transfer sample to Shredder column	1 ml tip	1	1.00	1.00
Discard Shredder column	1 column, tube	1	2.93	2.93
Add 350 ul ethanol	1 ml tip	1	1.00	1.00
Pipet sample to spin column twice	1 ml tip	2	1.00	2.00
Discard 1.5 ml microfuge tube	1.5 ml tube	1	1.00	1.00
Discard 2 ml collection tube	1 tube	2	1.00	2.00
Pipet 350 ul BR3	1 ml tip	1	1.00	1.00
Pipet 500 ul BR5	1 ml tip	2	1.00	2.00
Discard 2 ml collection tube	1 tube	2	1.00	2.00
Pipet 40 ul BR5	200 ul tip	1	0.28	0.28
Discard spin column	Column, tube	1	2.93	2.93
Total				**86.77**

Stabilized Blood-to-Cᴛ™ Nucleic Acid Preparation Kit				
Step in procedure	**Plastic description**	**# Used**	**Piece weight (g)**	**Total mass (g)**
Transfer 500 ul blood to 1.5 ml tube	1 ml tip	1	1.00	1.00
Remove supernatant	1 ml tip	1	1.00	1.00
Add PAXgene Wash (twice)	1 ml tip	2	1.00	2.00
Remove supernatant (twice)	1 ml tip	2	1.00	2.00
Prepare Digestion Solution/DNase	200 ul tip	1	0.28	0.28
	10 ul tip	1	0.18	0.18
Add Digestion Solution	200 ul tip	1	0.28	0.28
Discard 1.5 ml tube	1.5 ml tube	1	1.00	1.00
Prepare Stop Solution/Xeno	200 ul tip	1	0.28	0.28
	10 ul tip	1	0.18	0.18
Discard 1.5 ml tube	1.5 ml tube	1	1.00	1.00
Total				**9.20**
Waste Reduction				**89.4%**

Figure 1. Comparison of plastic waste generated using traditional RNA extraction methods to Stabilized Blood-to-Cᴛ™ Kits.

Headquarters
5791 Van Allen Way | Carlsbad, CA 92008 USA | Phone +1.760.603.7200 | Toll Free in the USA 800.955.6288
www.lifetechnologies.com

life technologies™