Stabilized Blood-to-C_T Nucleic Acid Preparation Kits

Introduction

We are committed to designing our products with the environment in mind. 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 Invitrogen™ Stabilized Blood-to-C_T™ Nucleic Acid Preparation Kits, as opposed to traditional RNA extraction methods, eliminates the need to use hazardous solvents—and requires fewer plastic consumables from sample preparation to final analysis.

Product description

Stabilized Blood-to-C_T 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 clean-up 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

Stabilized Blood-to-C_T kits require none of the hazardous chemicals mentioned above. Please review the SDS for the Stabilized Blood-to-C_T kits at thermofisher.com/documents.

Less waste

Traditional methodologies for RNA extraction require multiple steps for RNA extraction and cleanup—requiring the use of multiple disposable tubes, vials, pipettes, and pipette tips. Stabilized Blood-to-C_T kits require fewer plastic consumables than traditional technologies (Figure 1), reducing costs associated with lab plastics and waste disposal. A comparison of Stabilized Blood-to-C_T kits with traditional technology showed that traditional RNA extraction generated ~87 g of plastic waste (tubes, pipettes, pipette tips) compared to ~9 g for Stabilized Blood-to-C_T kits (Table 1).

Table 1. Comparison of waste generated using a traditional RNA extraction method vs. a Stabilized Blood-to-C_T kit.

Traditional blood RNA extraction methods		
Steps in procedure	**Plastics used**	**Total weight (g)**
Add 100% ethanol to buffer BR4	One 50 mL pipette	20.75
Prepare DNase I stock solution	One 1 mL tip	0.85
Aliquot DNase I solution	Five 200 µL tips	1.40
Remove supernatant	One 10 mL pipette	9.74
Pipet sample to spin column twice	Two 1 mL tips	2.00
Discard 1.5 mL microfuge tube	One 1.5 mL tube	1.00
Discard 2 mL collection tube	Two 2 mL tubes	2.00
Pipet 350 µL BR3	One 1 mL tip	1.00
Pipet RDD into 1.5 mL tube	One 200 µL tip	0.28
Add DNase I stock to RDD	One 10 µL tip	0.18
Add DNase I/RDD to column	One 200 µL tip	0.28
Discard 1.5 mL microfuge tube	One 1.5 mL tube	1.00
Pipet 350 µL BR3	One 1 mL tip	1.00
Pipet 500 µL BR4 (twice)	Two 1 mL tips	2.00
Discard 2 mL collection tube	Two 2 mL tubes	2.00
Pipet 40 µL BR5	One 200 µL tip	0.28
Discard spin column	One column/tube	2.93
Add 100% ethanol to Buffer BR4	One 50 mL pipette	20.75
Prepare DNase I stock solution	One 1 mL tip	0.85
Aliquot DNase I solution	Five 200 µL tips	1.40
Remove supernatant	One 10 mL pipette	9.74
Use fresh Hemogard closure	One Hemogard closure	2.62
Add 4 mL water	One 5 mL pipette	8.98
Remove supernatant	One 5 mL pipette	8.98
Discard blood RNA tube	One blood RNA tube	9.44
Add 350 µL BR1	One 1 mL tip	0.85
Add 300 µL BR2	One 1 mL tip	1.00
Add 40 µL proteinase K	One 200 µL tip	0.28
Discard 1.5 mL microfuge tube	One 1.5 mL tube	1.00
Transfer sample to shredder column	One 1 mL tip	1.00
Discard shredder column	One column/tube	2.93
Add 350 µL ethanol	One 1 mL tip	1.00
Pipet sample to spin column twice	Two 1 mL tips	2.00
Discard 1.5 mL microfuge tube	One 1.5 mL tube	1.00
Discard 2 mL collection tube	Two 2 mL tubes	2.00
Pipet 350 µL BR3	One 1 mL tip	1.00
Pipet 500 µL BR5	Two 1 mL tips	2.00
Discard 2 mL collection tube	Two 2 mL tubes	2.00
Pipet 40 µL BR5	One 200 µL tip	0.28
Discard spin column	One column/tube	2.93
Total		86.77

Table 1. Comparison of waste generated using a traditional RNA extraction method vs. a Stabilized Blood-to-C_T kit (continued).

Stabilized Blood-to-C_T Nucleic Acid Preparation Kit		
Steps in procedure	**Plastics used**	**Total weight (g)**
Transfer 500 µL blood to 1.5 mL tube	One 1 mL tip	1.00
Remove supernatant	One 1 mL tip	1.00
Add PAXgene Wash (twice)	Two 1 mL tips	2.00
Remove supernatant (twice)	Two 1 mL tips	2.00
Prepare digestion solution/DNase	One 200 µL tip One 10 µL tip	0.28 0.18
Add digestion solution	One 200 µL tip	0.28
Discard 1.5 mL tube	One 1.5 mL tube	1.00
Prepare digestion solution/Xeno control	One 200 µL tip One 10 µL tip	0.28 0.18
Discard 1.5 mL tube	One 1.5 mL tube	1.00
Total		**9.20**
Waste reduction		**89.4%**

Figure 1. Comparison of plastic waste generated using a traditional RNA extraction method vs. a Stabilized Blood-to-C_T Kit.

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