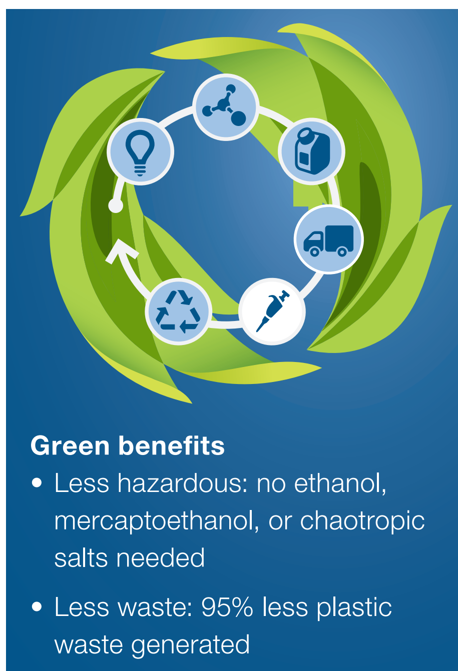
Cells-to-C_T kits

Comparison to traditional RNA extraction methods



Green benefits

- Less hazardous: no ethanol, mercaptoethanol, or chaotropic salts needed
- Less waste: 95% less plastic waste generated

Introduction

We are committed to designing products with the environment in mind—it's part of how we enable our customers to make the world healthier, cleaner, and safer. This fact sheet provides the rationale behind the environmental claims that use of these products results in reduced exposure to hazardous material and generates less waste than comparable products. Invitrogen™ Cells-to-C_T™ kits require no hazardous solvents, and far fewer plastic consumables from sample preparation to final analysis.

Product description

Cells-to-C_T kits include reagents and enzyme mixtures for reverse transcription and real-time PCR performed directly on cultured cell lysates 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

Cells-to-C_T kits require none of the hazardous chemicals mentioned above.

Please review the MSDS for the Cells-to-C_T kits at **thermofisher.com/msds**

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-C_T kits require fewer plastic consumables than traditional technologies (Figure 1), reducing costs associated with lab plastics and waste disposal. A comparison of Cells-to-C_T kits with traditional technology showed that ~139.7 g of plastic waste (tubes, pipettes, pipette tips) was generated with traditional RNA extraction, compared to ~6.7 g with Cells-to-C_T kits (Table 1).

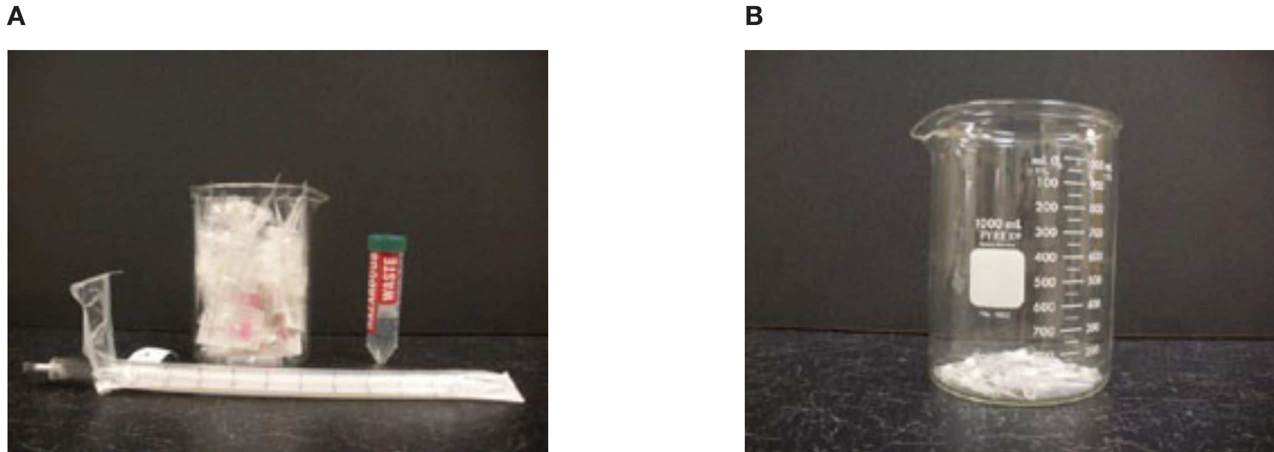


Figure 1. Comparison of plastic waste generated using (A) a traditional RNA extraction method vs. (B) a Cells-to-C_T kit.

Table 1. Comparison of the amount of waste generated using a traditional RNA extraction method vs. a Cells-to-C_T kit.

Traditional RNA extraction method		
Steps in procedure	Plastics used	Total weight (g)
1. Add 100% ethanol to buffer RPE	One 50 mL tip	20.8
2. Add B-ME to buffer RLT	One 1 mL tip	0.9
3. Tube for hazardous waste	One 50 mL tube	12.6
4. Add 350 μL buffer RLT to samples	Ten 1 mL tips	8.5
5. Add 70% ethanol to samples	Ten 1 mL tips	8.5
6. Add 500 μL buffer RPE to samples	Ten 1 mL tips	8.5
7. Add another 500 μL buffer RPE	Ten 1 mL tips	8.5
8. Tubes for samples	Ten 1.5 mL tubes	10.0
9. Add water to elute	Ten 200 μL tips	2.8
10. Add water to elute again	Ten 200 μL tips	2.8
11. gDNA eliminator columns	Ten columns, tubes	16.5
12. RNeasy™ spin columns	Ten columns, tubes	29.3
13. 2 mL collection tubes	Ten tubes	10.0
Total		139.7

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Table 1. Comparison of the amount of waste generated using a traditional RNA extraction method vs. a Cells-to-C_T kit *(continued)*.

Cells-to-C_T kit		
Steps in procedure	Plastics used	Total weight (g)
1. Aliquot lysis mix	One 1.5 mL tube, one 1 mL tip	1.9
2. Add DNase	One 20 µL tip	0.2
3. Add lysis solution to samples, mix	Ten 200 µL tips	2.8
4. Add stop solution to samples, mix	Ten 20 µL tips	1.8
Total		6.7
Waste reduction		95%

Find out more at **thermofisher.com/cellstoct**

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