

MasterPure™ Complete DNA and RNA Purification Kit

1. What is the MasterPure Complete Kit, and how does it work?

The MasterPure Complete Kit is designed for rapid, high-yield purification of nucleic acids—DNA, RNA, or total nucleic acids (TNA)—from a variety of sample types. The kit provides high yields without using spin columns or toxic chemicals, by using a simple desalting process to separate nucleic acids from proteins and other cellular components (Figure 1). The purified nucleic acids are suitable for many molecular biology applications, including PCR, cloning, transfection, and next gen sequencing (NGS).

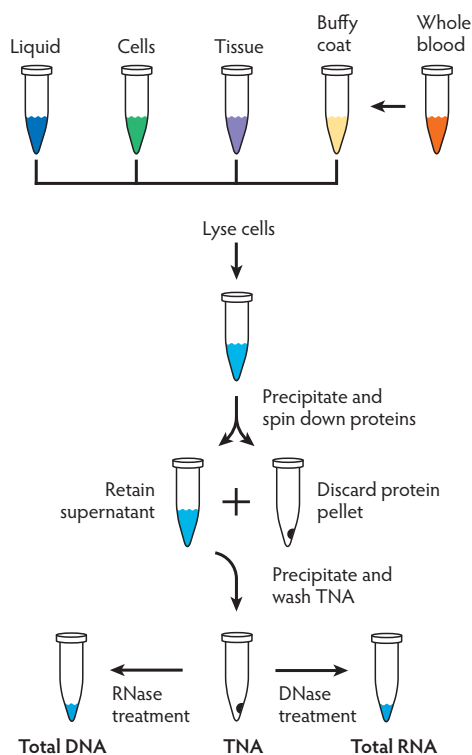


Figure 1. One kit for TNA, DNA, and RNA purification.

2. I need a quick, high-throughput process to isolate DNA for PCR. Should I use the MasterPure Complete Kit?

Although DNA purified with the MasterPure Complete Kit is certainly suitable for PCR, we recommend the QuickExtract™ DNA Extraction Solution ([Cat. No. QE09050](#)) and related kits instead. The QuickExtract kits are designed specifically for PCR-based applications, and you can extract DNA for many sample types in 8 minutes or less with a process that is easy to automate.

3. What kinds of samples can I use with the MasterPure Complete Kit?

The MasterPure Complete Kit is suitable for a wide range of human, animal, plant, and bacterial sample types. It can be used with tissue and organ samples, including formalin-fixed paraffin-embedded (FFPE) samples, as well as with both suspension and adherent cell cultures.

If you are interested in purifying DNA from blood samples (either whole blood or buffy coat), we recommend using the optimized MasterPure DNA Purification Kit for Blood Version II. This kit contains all the reagents needed and an optimized protocol that is function-tested with whole blood samples.

For Gram positive bacterial samples, we recommend the MasterPure Gram Positive DNA Purification Kit. If you are interested in purifying DNA or RNA from yeast, we recommend using the optimized MasterPure Yeast DNA or RNA Kits. Alternatively, if you prefer to purchase and use a single kit for all your DNA and RNA purification needs, then the MasterPure Complete DNA and RNA Kit is an excellent choice.

4. For what applications can I use the DNA or RNA purified with the MasterPure Complete Kit?

The MasterPure Complete Kit provides high yields of intact total DNA or RNA that is suitable for many common procedures, including cloning, endpoint and real-time PCR, NGS and capillary sequencing, bisulfite sequencing for epigenetics, ribosomal RNA analysis, and gene expression analysis. Many published studies demonstrate the versatility of the MasterPure Complete Kit, including challenging applications such as purifying DNA from *Daphnia* spp. for PCR and capillary sequencing [1], monitoring safety and quality in roasted peanuts by qPCR [2], and studying the human colon cancer methylome using microarray analysis and bisulfite sequencing [3].

5. How much starting material do I need for the MasterPure Complete Kit? How much DNA/RNA will I get after purification?

The MasterPure Complete Kit protocol can be scaled as needed to accommodate a broad range of sample input amounts, based on the desired yield of nucleic acids. See Table 1 for typical starting amounts and yields from various sample types.

Sample	Sample Size	Yield		
		TNA	DNA	RNA
Cells				
HeLa/HL60	1 x 10 ⁶ cells	10–30 µg	3–12 µg	7–15 µg
Tissues				
Liver	5 mg	33–42 µg	5–10 µg	13–25 µg
Brain	5 mg	9–13 µg	6–9 µg	4–11 µg
Heart	5 mg	6–10 µg	4–7 µg	4–5 µg
Kidney	5 mg	10–17 µg	3–8 µg	14–17 µg
Thymus	5 mg	15–30 µg	6–12 µg	9–18 µg
Mouse tail	0.5 cm	25–30 µg	9–11 µg	
Other				
Whole blood	200 µL	3–10 µg	3–9 µg	
Buffy coat	300 µL	40–55 µg	40–55 µg	3–6 µg
<i>E. coli</i>	3.5 x 10 ⁶ cells	2.5–2.8 µg	1.3–1.6 µg	1.6–1.8 µg
<i>S. mutans</i>	1.5 mL	0.9 µg		
Yeast* (<i>S. cerevisiae</i>)	2.2 x 10 ⁶ cells			11–18 µg
	1.1 x 10 ⁷ cells			70–78 µg

*Lucigen recommends the MasterPure Yeast DNA Purification Kit ([Cat. No. MPY80200](#)) for extracting DNA from yeast.

Table 1. High yields of purified nucleic acid from diverse sample types.

6. What is the best way to quantify DNA or RNA isolated using the MasterPure Complete Kit?

Spectrophotometric methods (e.g., A₂₆₀) to quantify DNA or RNA, although in common use, may overestimate the concentration. The best method to quantify DNA is by fluorometry using a DNA-specific dye, such as Hoechst 332581 (bisbenzimidazole), or PicoGreen® dye (Thermo Fisher Scientific). These dyes bind specifically to double-stranded DNA and not to nucleotides, single-stranded DNA, or RNA. To quantify RNA, we recommend using a Qubit™ fluorometer (Thermo Fisher Scientific) or a 2100 BioAnalyzer® instrument (Agilent).

FAQs

References

1. Gonçalves Athanasio C et al. 2016. Optimisation of DNA extraction from the crustacean *Daphnia*. *PeerJ* **4**:e2004.
2. Caldwell JM et al. 2016. Mitochondrial DNA fragmentation to monitor safety and quality in roasted peanuts. *Peanut Sci* **43**:94-105.
3. Irizarry RA et al. 2009. The human colon cancer methylome shows similar hypo- and hypermethylation at conserved tissue-specific CpG island shores. *Nature Genet* **41**:178-186.

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