Direct to PCR.
Fewer steps to discovery.

Robust PCR amplification without DNA purification—Direct PCR solutions

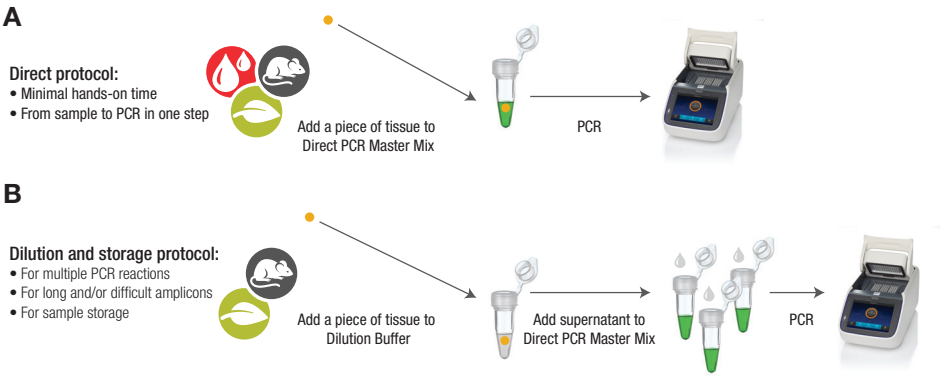
Thermo Scientific™ Direct PCR solutions offer outstanding convenience for DNA amplification by allowing PCR directly from unpurified samples. A tiny amount of sample material can be added directly into the PCR reaction for an efficient protocol, resulting in high yields and specific amplification of target DNA. Eliminating DNA purification from the PCR workflow offers significant savings in time and cost.

How does Direct PCR work?

Direct PCR solutions are based on the engineered Thermo Scientific™ Phire™ and Phusion™ DNA polymerases, which offer highly robust amplification and tolerance to many PCR inhibitors present in unpurified samples. Both DNA polymerases are fused to a small dsDNA binding protein, which helps achieve high tolerance to inhibitors, increased speed, and better yields.

Benefits of direct PCR

- Helps save time and cost, requiring no DNA extraction or purification
- High yields of specific products with robust hot-start polymerases
- Fast PCR with short PCR cycling times (Figure 1)
- Minimal sample material required
- Direct and dilution protocols offer convenience and flexibility for optimization (Figure 1)
- Tested protocols support direct PCR for a wide variety of sample types (Figure 2)
- Minimized pipetting using master mix formats with pre-added loading dyes
- Rich composition—PCR controls, water, and DNA ladder included



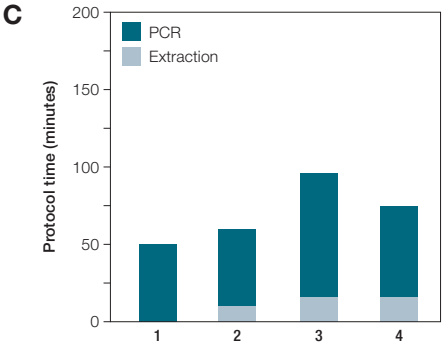


Figure 1. Direct and dilution protocols for a versatile and efficient workflow. (A) Direct protocol offers minimal hands-on time. **(B)** Dilution protocol offers workflow flexibility and optimization. **(C)** Thermo Scientific™ Direct PCR master mix offers the shortest protocol compared with leading suppliers. 1: Thermo Scientific™ Phire™ Tissue Direct PCR Master Mix. 2: KAPA Mouse Genotyping Kit (2X) 3: Sigma RED Extract-N-Amp™ Tissue PCR Kit 4: Bioline My-Taq™ Extract-PCR Kit.

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Technical features:

- Includes optimized formats for animal and human tissues and blood samples (Figure 2), as well as plant samples
- Supports robust PCR of long amplicons (Figure 3); up to ~7.5 kb for certain sample types
- Samples in dilution buffer can be stored for up to 4 weeks at different temperatures (–20°C, +4°C, or room temperature) before using in PCR
- Key tested samples include a variety of animal tissues, fruit fly, nematode, zebrafish, bacteria, various leaves, seeds, and whole and preserved blood—complete lists of samples tested are available at **thermofisher.com/directpcr**

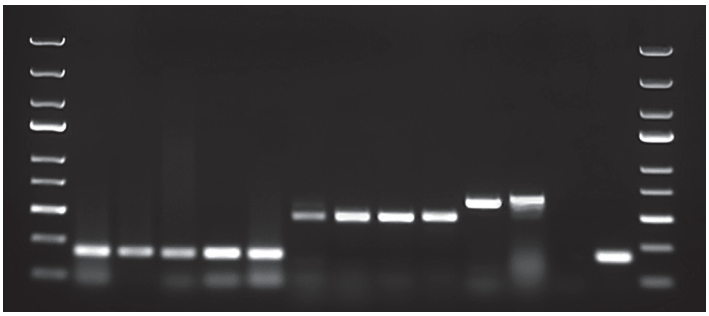

Figure 2. High yields and specific amplification across different tissue types. DNA fragments from different human and animal tissue samples were amplified with the Phire Tissue Direct PCR Master Mix. Mouse (1) tail, (2) ear, and (3) hair; bird (4) muscle and (5) feather; human (6) hair, (7) tooth, (8) nail, and (9) saliva; (10) zebrafish muscle; and (11) fruit fly. M: Thermo Scientific™ O'GeneRuler™ Express DNA Ladder. Positive control is indicated by "+"; no-template control is indicated by "–".

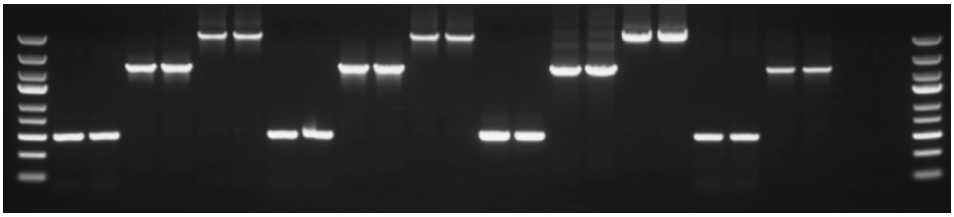

Figure 3. Extreme robustness with a wide range of amplicon lengths. 500 bp, 2 kb, and 5.1 kb fragments were amplified in duplicate directly from Arabidopsis leaf punches of indicated sizes with Phire Plant Direct PCR Master Mix and other vendors' kits. Arabidopsis tissue preparation and PCR were performed according to supplier instructions. Lanes 1 and 26: O'GeneRuler Express DNA Ladder; lanes 2–7: Phire Plant Direct PCR Master Mix, direct protocol (1 mm punch); lanes 8–13: Phire Plant Direct PCR Master Mix, dilution protocol (2 mm punch); lanes 14–19: Bioline My-Taq™ Plant-PCR Kit (1 mm punch); lanes 20–25: Sigma REDExtract-N-Amp™ Plant PCR Kit (5 mm punch).

Usage and applications

Choose Direct PCR for applications where long-term DNA archival is not necessary.

- Genotyping
- Colony screening
- Species identification
- Transgene or plasmid detection

Ordering information

Product	Quantity		Cat. No.
Direct PCR master mixes	**Direct protocol**	**Dilution and storage protocol**	
Phire Tissue Direct PCR Master Mix*	100 x 50 µL rxns 500 x 50 µL rxns	250 x 20 µL rxns 1,250 x 20 µL rxns	F-170S F-170L
Phire Plant Direct PCR Master Mix*	100 x 50 µL rxns 500 x 50 µL rxns	250 x 20 µL rxns 1,250 x 20 µL rxns	F-160S F-160L
Phusion Blood Direct PCR Master Mix*	100 x 20 µL rxns 500 x 20 µL rxns	NA NA	F-175S F-175L

* Also available as stand-alone kits.

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

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