

Integrated Solutions — Automated Sample Preparation

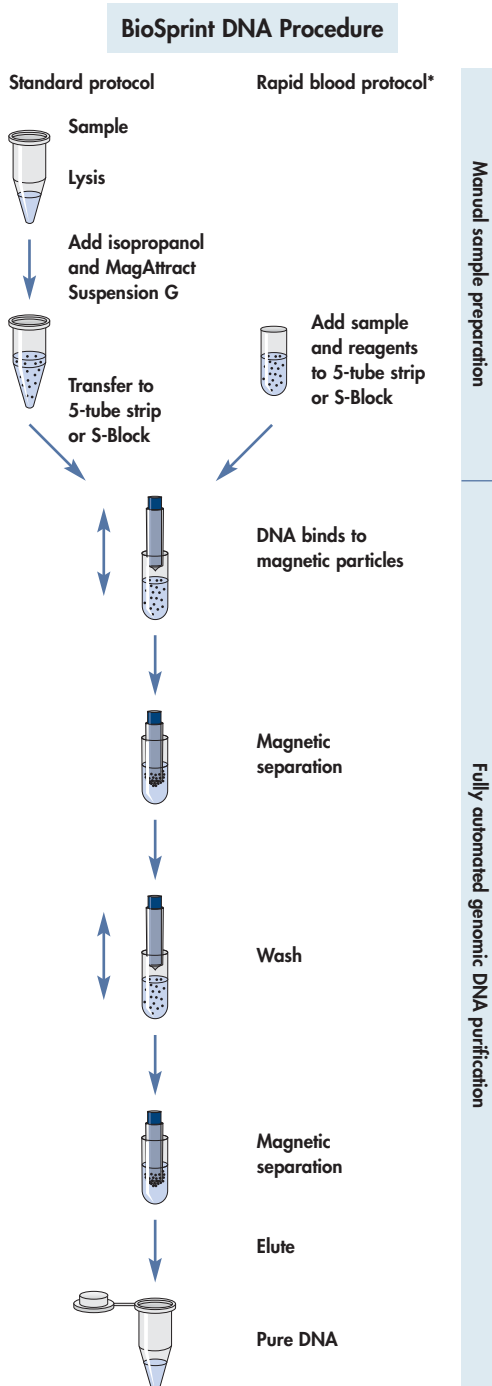
Models of efficiency — the affordable BioSprint 15 and BioSprint 96

New



The BioSprint system

BioSprint workstations and kits provide all you need for rapid and cost-efficient automated sample preparation — whatever your throughput needs. The BioSprint system uses proven MagAttract® magnetic-particle technology for purification of high-quality genomic DNA for genotyping applications.



BioSprint workstations and kits give you:

- **A convenient automated procedure** — saving time and effort
- **A cost-efficient solution** — economically priced workstations for up to 15 or 96 samples per run
- **Fast startup and immediate results** — with easy-to-use, preinstalled BioSprint protocols
- **Flexibility and versatility** — use the protocols supplied or easily design your own
- **Rapid purification of high-quality genomic DNA** — ready to use in sensitive downstream applications

Convenient and rapid automated procedure

BioSprint workstations and kits enable rapid and cost-effective purification of genomic DNA from cells, tissue, and blood, and are ideally suited for research and veterinary labs performing genotyping applications. Purification of genomic DNA is a labor-intensive procedure involving numerous tedious and time-consuming steps. Automated sample processing has many advantages over manual methods, including better reproducibility from sample to sample and a more efficient workflow.

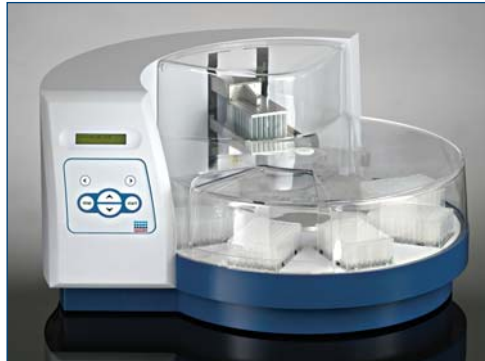
BioSprint workstations and kits enable rapid and convenient automated sample preparation and eliminate time-consuming processing steps (see Flowchart and Figure 1). Two BioSprint workstations with different throughputs are available: the BioSprint 15 for processing 1–15 samples per run and the BioSprint 96 for processing up to 96 samples per run. Genomic DNA purified using BioSprint workstations is highly suited for use in genotyping applications, including screening of transgenic animals, genetic predisposition studies, and marker assisted breeding.

* Rapid protocol only available for blood.

BioSprint 15 Workstation



BioSprint 96 Workstation



Easy-to-use, cost-efficient solution

Each BioSprint workstation is an open system with a small footprint and is easily operated through a touchpad keyboard. No external computer is required, saving valuable laboratory space. Because of the minimal number of mechanical components, the workstations are both economically priced and easy to install. Each workstation comes preinstalled with a variety of protocols, assuring fast startup and immediate results.

The range of sample types that can be processed using BioSprint Kits is continuously expanding. Supplementary protocols for automated purification of genomic DNA from a wide range of sample types using BioSprint Kits are available at www.qiagen.com/literature/protocols or from your local QIAGEN Technical Service Department.

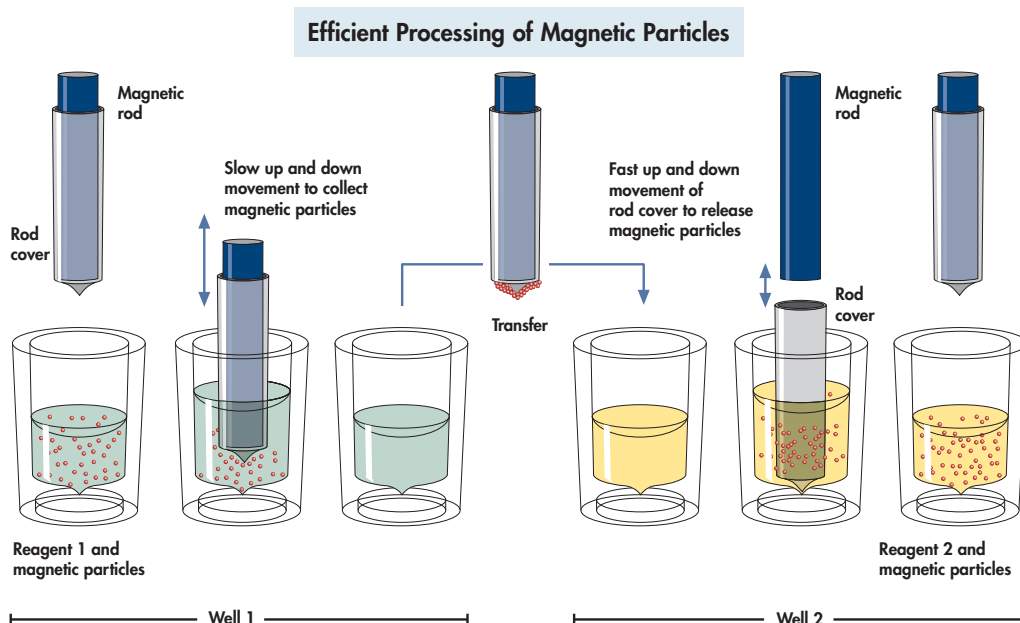


Figure 1 Each workstation controls an array of magnetic rods that can attract or release magnetic particles and transfer them from tube to tube or well to well. The sequential transfer of magnetic particles allows a rapid purification procedure to be performed.

Reproducible Purification of DNA from Sheep Ear Tissue

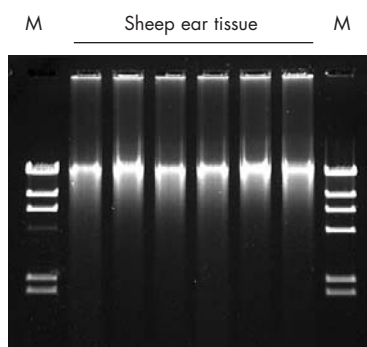


Figure 2 Sheep ear tissue samples were treated with 180 μ l Buffer ATL and 20 μ l QIAGEN[®] Proteinase K at 56°C overnight. Genomic DNA was purified from the lysed tissue samples using the BioSprint 15 DNA Blood Kit with the BioSprint 15 DNA Tissue protocol. DNA was eluted in 200 μ l elution buffer. Eluates (5 μ l) were run on a 0.8% agarose gel in 1x TBE. **M**: markers (Lambda HindIII).

Purification of High-Quality DNA from Fresh and Frozen Blood

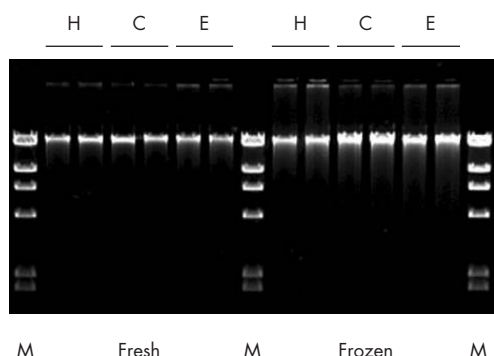
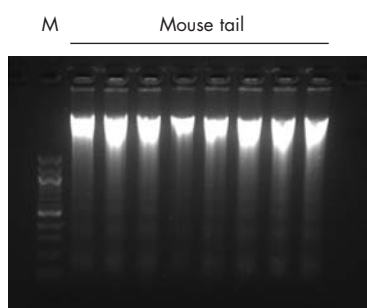


Figure 3 Human blood was collected and treated with one of 3 anticoagulants: heparin (**H**), citrate (**C**), or EDTA (**E**). DNA was purified from 200 μ l blood immediately after blood collection (**Fresh**) and after one cycle of freezing and thawing (**Frozen**) using the BioSprint 15 DNA Blood Kit. DNA was eluted in 200 μ l elution buffer. Eluates (15 μ l) were run on a 0.8% agarose gel in 1x TBE. **M**: markers (Lambda HindIII).

Purification of High-Quality Genomic DNA from Mouse Tail



BioSprint 15 workstation

The BioSprint 15 provides automated, low-throughput purification of genomic DNA from a wide range of sample types (Table 1, page 5). BioSprint 15 Kits enable purification of genomic DNA from cells, tissues, and blood, total DNA from plant material, as well as purification of recombinant proteins. Lysed samples are loaded into the workstation, which then performs all steps to yield pure target molecules (e.g., genomic DNA), saving time and effort. High-quality genomic DNA can be purified from up to 15 pre-lysed samples in just 20 minutes (Figures 2 and 3).

BioSprint 96 workstation

The BioSprint 96 workstation provides a complete solution for high-throughput sample preparation. Pre-lysed samples are loaded into the workstation, which then performs fully automated sample processing in a 96-well format. The BioSprint 96 enables DNA purification from cells, tissues, blood, plant material, and veterinary samples, cleanup of DNA from amplification reactions, and purification of recombinant proteins. The BioSprint 96 is ideally suited for routine high-throughput sample preparation and also for times when there is a sudden demand for high-throughput sample processing (for example, with genotyping projects). High-quality genomic DNA can be purified from up to 96 pre-lysed samples in just 20 minutes (Table 1 and Figure 4). The purification procedure is highly reproducible, as shown by comparison of DNA yields from run to run (Figure 5).

Reproducible Yields of High-Quality DNA

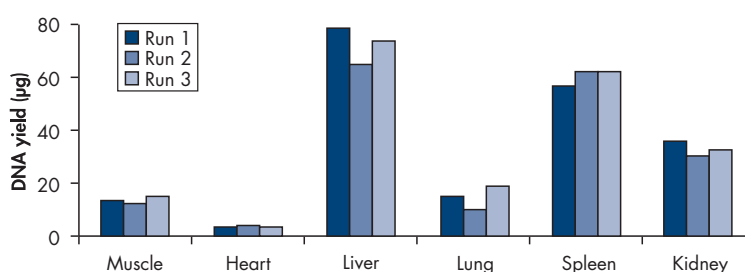


Figure 5 Genomic DNA was purified from the indicated bovine tissue samples after overnight lysis at 56°C with 180 μ l Buffer ATL and 20 μ l QIAGEN Proteinase K. Purification was carried out using the BioSprint 96 DNA Blood Kit with the BioSprint 96 DNA Tissue protocol. The yields of DNA from 3 different runs are shown.

Figure 4 Mouse tail samples were treated with 180 μ l Buffer ATL and 20 μ l QIAGEN Proteinase K at 56°C overnight. Genomic DNA was purified from the lysed tissue samples using the BioSprint 96 DNA Blood Kit with the BioSprint 96 DNA Tissue protocol. DNA was eluted in 200 μ l elution buffer. Eluates (2 μ l) from 8 out of 96 samples were visualized by agarose gel electrophoresis. **M**: markers.

BioSprint Kits enable purification of high-quality genomic DNA

Purity of DNA has a significant effect on the accuracy of results obtained in downstream applications. Sensitive downstream applications, such as real-time PCR, demand the use of highly pure DNA for reliable results. BioSprint DNA Blood Kits, the first kits to be introduced in the expanding range, use proven MagAttract magnetic-particle technology for purification of high-quality genomic DNA from cells, tissue, and blood. The automated purification procedure completely removes all contaminants and enzyme inhibitors. Purified DNA is ready for direct use in demanding downstream applications, such as real-time PCR and amplification of single-copy genes (Figures 6 and 7). Reliable data from downstream applications are delivered the first time, every time. BioSprint Kits provide all the necessary reagents and plasticware for sample preparation and are available in different sizes, enabling cost-efficient use of consumables.

Table 1. Average DNA Yields from a Range of Sample Types

Sample type	Amount of sample	Average DNA yield (µg)	
		BioSprint 15	BioSprint 96
Bovine tissue			
Muscle	25 mg	16.2 ± 2.5	13.5 ± 1.5
Heart	25 mg	5.9 ± 2.6	3.4 ± 0.6
Spleen	25 mg	69.1 ± 23.6	59.1 ± 4.8
Lung	25 mg	13.8 ± 7.2	14.7 ± 5.5
Liver	25 mg	77.8 ± 29.4	74.0 ± 22.3
Kidney	25 mg	26.2 ± 18.8	33.5 ± 5.4
Sheep tissue			
Ear	30 mg	20.31 ± 1.8	Not tested
Mouse tissue			
Tail	1.2 cm (~25 mg)	32.7 ± 4.6	30.9 ± 4.5
Cultured cells			
HL-60	2 × 10 ⁶ cells	10.1 ± 4.7	9.6 ± 5.6
Blood			
Human (5–7 × 10 ⁶ cells per ml)	200 µl	4.5–9.0	4.5–9.0
Bovine	200 µl	6.2–8.0	4.4–7.0
Sheep	200 µl	5.6–11.2	1.2–8.0
Pig	200 µl	4.5–9.0	4.5–9.0
Mouse	100 µl	2.0–8.0	1.5–3.0
Rat	100 µl	1.0–4.0	1.0–3.0
Bird	10 µl*	15.0 ± 6.3	Not tested

Genomic DNA was purified from the indicated samples. DNA was eluted in 200 µl Buffer AE.

* Sample diluted to 200 µl.

Efficient and Sensitive Real-Time PCR

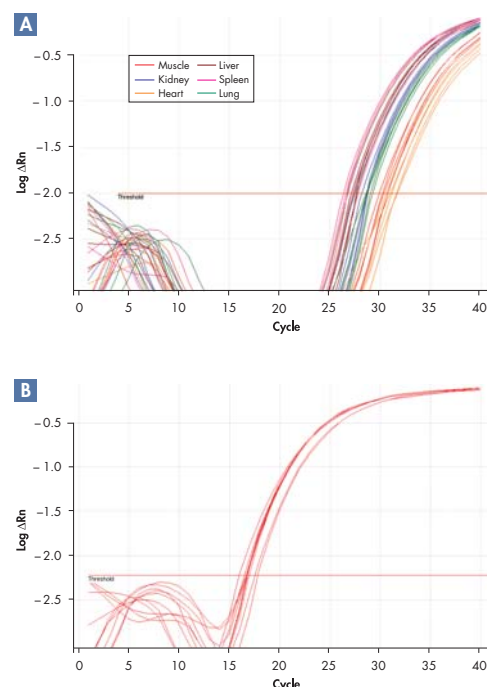


Figure 6 Genomic DNA was purified from a range of bovine tissue samples and from mouse tail samples after overnight lysis at 56°C with 180 µl Buffer ATL and 20 µl QIAGEN Proteinase K. Purification was carried out using the BioSprint 96 DNA Blood Kit with the BioSprint 96 DNA Tissue protocol. The *c-jun* gene was amplified using **A** 0.2 µl purified DNA from each bovine tissue sample or **B** 5 µl purified DNA from mouse tail samples. Amplification reactions (50 µl) were carried out on the Rotor-Gene™ system using the QuantiTect® Probe PCR Kit with gene-specific primers and probe.

Efficient Amplification of the Single-Copy Gene MECL-1

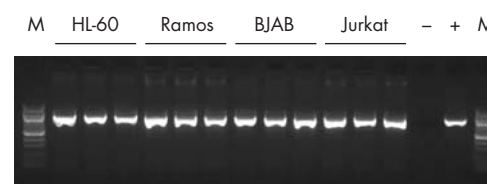


Figure 7 Genomic DNA was purified from the indicated cell types. Purification was carried out using the BioSprint 96 DNA Blood Kit and BioSprint 96 DNA Blood 200 protocol. DNA was eluted in 200 µl elution buffer. The single-copy gene MECL-1 was amplified using 5 µl purified DNA in a final reaction volume of 50 µl. Amplification was carried out using the Taq PCR Core Kit. A 5 µl aliquot of each PCR was run on a 1.5% agarose gel. -: negative control; +: positive control; M: 100 bp ladder.

High yields of pure genomic DNA

The optimized protocols provided with BioSprint Kits enable purification of high-quality genomic DNA. In contrast to a kit using magnetic-particle purification technology from Supplier P, the BioSprint 15 DNA Blood Kit enabled purification of highly pure DNA (Figure 8A). The yields of genomic DNA obtained using the BioSprint 15 DNA Blood Kit were also consistently higher (Figure 8B).

Reproducible Purification of Pure Genomic DNA

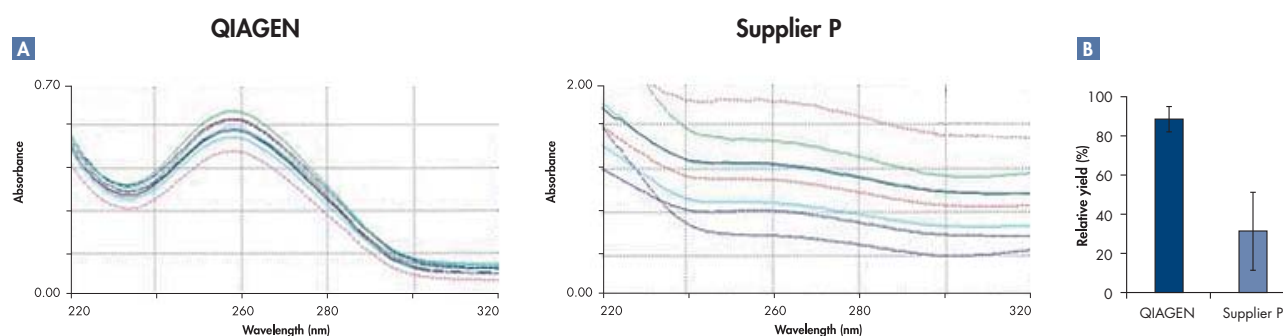


Figure 8 Human blood was collected and treated with citrate. DNA was purified from 8 fresh blood samples (200 µl each) using the BioSprint 15 DNA Blood Kit (QIAGEN) or a kit from another supplier (Supplier P) according to manufacturers' instructions. DNA was eluted in 200 µl elution buffer. **A** Spectrophotometric analysis of purified genomic DNA. **B** The relative yield of purified genomic DNA from 8 blood samples was calculated by comparing the actual yield with the theoretical yield obtainable from 200 µl blood after counting white blood cells.

The combination of BioSprint workstations and kits gives you:

- **High yields of genomic DNA** — using a convenient automated procedure and optimized protocols
- **High-quality genomic DNA ready for use in genotyping applications** — contaminants and enzyme inhibitors are completely removed
- **Affordable automated sample preparation** — choose high- or low-throughput automation depending on your needs

Ordering Information

Product	Contents	Cat. no.
BioSprint 15	Robotic workstation for automation of magnetic-particle purification technology	9000850
BioSprint 15 DNA Blood Kit (45)	For 45 preps: 5-Rod Covers, 5-Tube Strips, MagAttract Suspension G, Buffers and Reagents	940014
BioSprint 15 DNA Blood Kit (360)	For 360 preps: 5-Rod Covers, 5-Tube Strips, MagAttract Suspension G, Buffers and Reagents	940017
BioSprint 96	Robotic workstation for automation of magnetic-particle purification technology	9000852
BioSprint 96 DNA Blood Kit (48)	For 48 preps: Large 96-Rod Covers, 96-Well Microplates MP, S-Blocks, MagAttract Suspension G, Buffers and Reagents	940054
BioSprint 96 DNA Blood Kit (384)	For 384 preps: Large 96-Rod Covers, 96-Well Microplates MP, S-Blocks, MagAttract Suspension G, Buffers and Reagents	940057
Buffer ATL (200 ml)*	200 ml Tissue Lysis Buffer for 1000 preps	19076

* Required for the BioSprint DNA Tissue protocol.

Product	Contents	Cat. no.
QIAGEN Proteinase K (2 ml)*†	2 ml (>600 mAU/ml, solution)	19131
Related products		
QuantiTect Probe PCR and RT-PCR Kits — for quantitative, real-time PCR and RT-PCR using sequence-specific probes		
QuantiTect Probe PCR Kit (200)†	For 200 x 50 µl reactions: 3 x 1.7 ml QuantiTect Probe PCR Master Mix (providing a final concentration of 4 mM MgCl ₂), 2 x 2 ml RNase-Free Water	204343
QuantiTect Probe RT-PCR Kit (200)†	For 200 x 50 µl reactions: 3 x 1.7 ml QuantiTect Probe RT-PCR Master Mix (providing a final concentration of 4 mM MgCl ₂), 100 µl QuantiTect RT Mix, 2 x 2 ml RNase-Free Water	204443
Taq PCR Core Kit — for standard and specialized PCR applications, includes dNTP mix		
Taq PCR Core Kit (250 U)†	250 units Taq DNA Polymerase, 10x PCR Buffer (containing 15 mM MgCl ₂), 5x Q-Solution, 25 mM MgCl ₂ , dNTP Mix (containing 10 mM each dNTP)	201223
TissueLyser — for high-throughput disruption of a wide range of biological samples		
TissueLyser (100 V, 50/60 Hz)	Universal laboratory mixer-mill disruptor, 100 V, 50/60 Hz	85200
TissueLyser (120 V, 50/60 Hz)	Universal laboratory mixer-mill disruptor, 120 V, 50/60 Hz	85210
TissueLyser (220–240 V, 50/60 Hz)	Universal laboratory mixer-mill disruptor, 220–240 V, 50/60 Hz	85220

* Required for the BioSprint DNA Tissue protocol.

† Larger size available; please inquire.

QuantiTect Probe Kits are intended for research use. No claim or representation is intended to provide information for the diagnosis, prevention, or treatment of a disease.

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Visit www.qiagen.com/automation today and discover how to save time and effort with BioSprint workstations and kits!

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