APPLICATION NOTE

# Standardized purification of DNA from blood using the BioRobot® M48 workstation with MagAttract® technology

*This study shows the reproducible purification of DNA from 48 whole blood samples using the BioRobot® M48 workstation in combination with the MagAttract®* DNA Blood Mini M48 Kit.*

## Introduction

Fully automated solutions for nucleic acid purification must provide high levels of reproducibility in terms of sample yield, quality, and performance.

## Materials and methods

Fully automated purification of DNA was performed on EDTA-preserved whole blood samples (6.1 x $10^6$ white cells/ml) from a single donor using the MagAttract DNA Blood Mini M48 Kit in combination with the BioRobot M48 workstation. The 200 µl Blood protocol was used and purified DNA was eluted in 200 µl RNase-free water. DNA yield was quantified by absorbance ($A_{260}$) with background correction. Amplification of a 900 bp fragment of the single-copy *MECL-1* gene (proteasome-like subunit) was performed using 5 µl DNA in a 50 µl PCR.

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## Results

Average DNA yield for all 48 samples was 5.4 µg ± 0.17 µg, which corresponds to a deviation of approximately 3% (Figure 1). Average DNA purity was consistently high ($A_{260}/A_{280}$=1.87; S.D.=0.01). Agarose gel electrophoresis showed consistent high-quality DNA (Figure 2). In addition, clean, strong bands were observed for the single-copy PCR amplification (Figure 3).

## Reproducible Yields

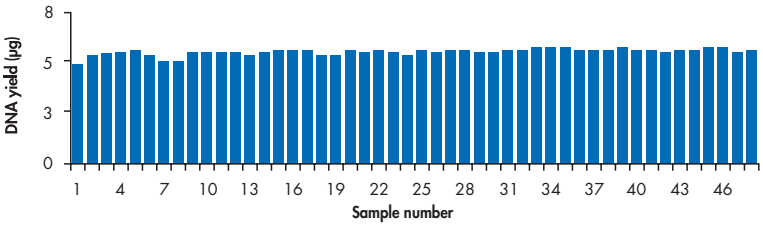


***Figure 1.*** *DNA yields from 48 blood samples from the same donor using the BioRobot M48 workstation.*

## Reproducible High-Quality DNA

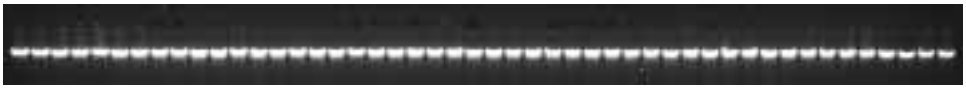

***Figure 2.*** *High-quality genomic DNA purified from 48 blood samples using the BioRobot M48 workstation. 10 µl of each 200 µl eluate was analyzed by agarose gel electrophoresis.*

## Reproducible Performance in Sensitive PCR Analysis

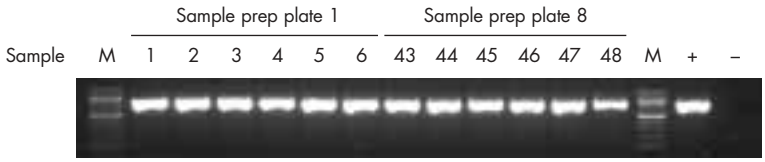


***Figure 3.*** *Amplification of a single-copy gene (*MECL-1*) using template DNA purified from whole blood. Samples 1–6 and 43–48 are from the first and last sample prep plate positions on the BioRobot M48 worktable, respectively. All blood samples were obtained from the same donor.* ***M****: 100 bp DNA ladder (100 ng);* ***+****: positive control;* ***–****: negative control. 5 µl (10%) of each PCR was loaded on the agarose gel.*



## Conclusions

These results clearly demonstrate high reproducibility in both yield and quality of DNA purified using the BioRobot M48 workstation in combination with MagAttract magnetic particle technology.

Purification of DNA from whole blood using the BioRobot M48 workstation and MagAttract technology results in:

- **Highly reproducible yields** — average 5.4 µg ± 0.17 µg DNA from 200 µl blood
- **High-quality DNA** — consistently strong, smear-free bands from all 48 samples
- **High-performance PCR** — strong, clean bands even from single-copy genes

## Ordering Information

| Product | Description | Order No. |
|---|---|---|
| BioRobot M48 workstation | Robotic workstation for automation of magnetic-particle purification technology | 9000708 |
| MagAttract DNA Blood Mini M48 Kit (192)* | MagAttract Suspension and reagents for purification of genomic DNA from 200 µl whole blood samples using the BioRobot M48 workstation | 951336 |

The BioRobot M48 is intended as a microtiter diluting and dispensing device. No claim or representation is intended for its use in identifying any specific organism or for a specific clinical use (diagnostic, prognostic, therapeutic, or blood banking). It is the user's responsibility to validate the performance of the BioRobot M48 for any particular use, since its performance characteristics have not been validated for any specific organism. The BioRobot M48 may be used in clinical diagnostic laboratory systems after the laboratory has validated their complete system as required by CLIA '88 regulations in the U.S. or equivalents in other countries.

* MagAttract Kits are intended as general-purpose devices that may be used in clinical diagnostic laboratory systems after the laboratory has validated their complete system as required by CLIA '88 regulations in the U.S. or equivalents in other countries.

## Contact QIAGEN today to discover more about standardized purification of DNA from blood.

QIAGEN Robotic Systems are not available in all countries; please inquire.

The PCR process is covered by U.S. Patents 4,683,195 and 4,683,202 and foreign equivalents owned by Hoffmann-La Roche AG.



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