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High-performance PCR template DNA from preserved blood samples using MagAttract® technology and the BioRobot® M48 workstation

Clinical research applications, such as genotyping, require multiple assays to be performed from a single sample. The numbers of analyses that can be performed from a single DNA sample depend on both the concentration and the quality of the sample. This introduces the need for a robust and efficient purification technology that provides efficient yields of high-quality DNA. The purified DNA must also perform well in downstream assays and be free of PCR inhibitors. This study shows the PCR performance of DNA purified from citrate- (ACD), heparin-, and EDTA-preserved whole blood samples using MagAttract®* technology and the BioRobot® M48 workstation.

Materials and methods

Automated DNA purification was performed on ACD-, heparin- and EDTA-preserved whole blood samples using the MagAttract DNA Blood Mini and Midi M48 Kits on the BioRobot M48 workstation. All blood samples were collected from the same donor. Protocols using both 200 μ l and 350 μ l sample volumes were performed and purified DNA was eluted in 200 μ l RNase-free water.





 A dilution series of the isolated DNA was used in PCR amplifications of a 900 bp fragment of the single-copy gene MECL-1 (proteasome-like subunit). PCR amplification was performed using 15-0.25 µl purified DNA in a 50 µl reaction.

Results

Strong, clean bands were observed for all single-copy amplifications using template DNA isolated from ACD, heparin- and EDTA-preserved blood using the BioRobot M48 workstation in combination with MagAttract technology. PCR products were clearly visible using as little as 0.25 µl template DNA. No inhibition of PCR was observed, even when using 15 µl template DNA in a 50 µl PCR.

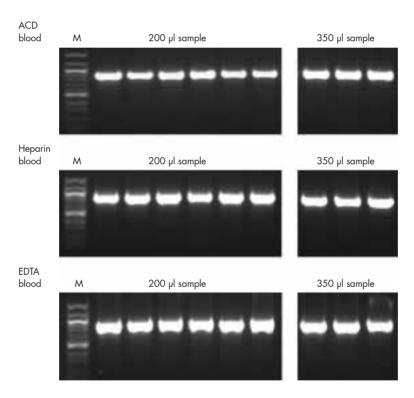


Figure 1. Amplification (34 cycles) of the MECL-1 single-copy gene from ACD-, heparin- and EDTA-preserved whole blood. 5 µl of 200 µl purified DNA was used in a 50 µl PCR. 5 µl of the PCR product was analyzed by agarose gel electrophoresis. M: 100 bp DNA ladder (100 ng).

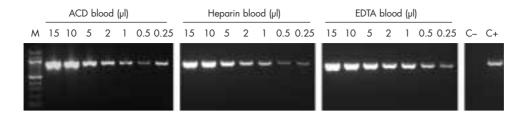


Figure 2. Amplification (34 cycles) of the MECL-1 single-copy gene (900 bp fragment) from dilution series of DNA purified from 200 µl ACD-, heparin- and EDTA-preserved whole blood samples. M: 100 bp DNA ladder; C-: negative control; C+: positive control.

Conclusions

MagAttract technology and the BioRobot M48 workstation provide a robust and efficient solution for fully automated purification of template DNA from whole blood samples.

- DNA purified from whole blood using MagAttract technology on the BioRobot M48 workstation performs well in sensitive PCR analysis
- Common blood preservatives (ACD, heparin, and EDTA) do not affect PCR performance of MagAttract purified DNA from whole blood
- Fully automated MagAttract technology yields high-quality DNA from 200 µl blood, sufficient for up to 800 PCR analyses



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
MagAttract DNA Blood Midi M48 Kit (192)*	MagAttract Suspension and reagents for purification of genomic DNA from 350 µl whole blood samples using the BioRobot M48 workstation	951356

The BioRobot M48 is intended as a microtiter diluting and dispensing device. No claim or representation is intended for their 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 their 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. No claim or representation is intended for their use to identify any specific organism or for specific clinical use (diagnostic, prognostic, therapeutic, or blood banking). It is the user's responsibility to validate the performance of MagAttract Kits for any particular use, since the performance characteristics of these kits have not been validated for any specific organism.

Contact QIAGEN today to discover more about reliable yields 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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