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MagAttract® DNA Blood M48 Handbook

MagAttract DNA Blood Mini and Midi M48 Kit

For DNA purification from human whole blood and buffy coat using the BioRobot® M48 workstation

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QIAGEN Sample and Assay Technologies

QIAGEN is the leading provider of innovative sample and assay technologies, enabling the isolation and detection of contents of any biological sample. Our advanced, high-quality products and services ensure success from sample to result.

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- Nucleic acid and protein assays
- microRNA research and RNAi
- Automation of sample and assay technologies

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Contents

Kit Contents

MagAttract DNA Blood M48 Kits Catalog no. Preps per kit	Mini Kit (192) 951336 192	Midi Kit (192) 951356 192
MagAttract Suspension B	2 x 10 ml	3 x 10 ml
Buffer ML	3 x 54 ml	5 x 54 ml
Buffer MW1	2 x 77 ml	4 x 77 ml
Buffer MW2	87 ml	87 ml
RNase-free water	90 ml	100 ml
Quick-Start Protocol	1	1

Storage

All buffers and reagents should be stored at room temperature (15–25°C).

Intended Use

MagAttract DNA Blood M48 Kits are intended for molecular biology applications. These products are not intended for the diagnosis, prevention, or treatment of a disease.

All due care and attention should be exercised in the handling of the products. We recommend all users of QIAGEN® products to adhere to the NIH guidelines that have been developed for recombinant DNA experiments, or to other applicable guidelines.

Safety Information

When working with chemicals, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, please consult the appropriate safety data sheets (SDSs). These are available online in convenient and compact PDF format at www.qiagen.com/safety where you can find, view, and print the SDS for each QIAGEN kit and kit component.

CAUTION: DO NOT add bleach or acidic solutions directly to the sample preparation waste.

Buffers MW1 and ML contain guanidine hydrochloride/guanidine thiocyanate, which can form highly reactive compounds when combined with bleach.

If liquid containing these buffers is spilt, clean with suitable laboratory detergent and water. If the spilt liquid contains potentially infectious agents, clean the affected area first with laboratory detergent and water, and then with 1% (v/v) sodium hypochlorite. If liquid containing potentially infectious agents is spilt on the BioRobot M48, clean the affected area first with laboratory detergent and water, and then with 1% (v/v) sodium hypochlorite, followed by water.

24-hour emergency information

Emergency medical information in English, French, and German can be obtained 24 hours a day from:
Poison Information Center Mainz, Germany. Tel: +49-6131-19240

Quality Control

In accordance with QIAGEN's ISO-certified Total Quality Management System, each lot of the MagAttract DNA Blood M48 Kit is tested against predetermined specifications to ensure consistent product quality.

Introduction

MagAttract DNA Blood M48 Kits provide fully automated purification of total (genomic and mitochondrial) DNA from human whole blood and blood products. MagAttract technology provides high-quality DNA, which is suitable for direct use in downstream applications, such as amplification or other enzymatic reactions. The BioRobot M48 performs all steps of the sample preparation procedure, and the procedure can be scaled up or down, allowing purification from varying amounts of starting material.

Principle and procedure

MagAttract technology combines the speed and efficiency of silica-based DNA purification with the convenient handling of magnetic particles. DNA binds to the silica surface of the magnetic particles in the presence of a chaotropic salt (see flowchart, page 7). DNA bound to the magnetic particles is then efficiently washed. Two different wash buffers are used, followed by a rapid rinse with distilled water, which considerably improves the purity of the DNA. High-quality DNA is eluted in the water provided. DNA yields depend on sample type, sample storage, and white blood cell content (for whole blood samples).

Starting material

The amounts of starting material for use in MagAttract DNA M48 procedures are shown in Table 1 on page 8. The sample and elution volumes for each protocol can be scaled within the ranges shown to give a yield and concentration of high-quality DNA appropriate for the intended downstream application.

Buffy coat samples may vary considerably in leukocyte concentration depending on the number of nucleated cells in the original whole blood sample and the efficiency of leukocyte harvesting during the buffy coat preparation. To avoid overloading the MagAttract purification procedure, if using highly enriched buffy coat samples (> 9x enrichment), smaller volumes of starting material should be used. (See Table 1 on page 8 for recommended starting volumes.) Efficiency of buffy coat enrichment depends on the sample preparation procedure used and on the accuracy used when extracting the buffy coat layer. Three different protocols (for different buffy coat enrichments) are provided for purification of genomic DNA from buffy coat on the BioRobot M48 workstation. The recommended amounts of starting material for the three different protocols are given in Table 1 on page 8.

The MagAttract DNA Blood M48 Procedure

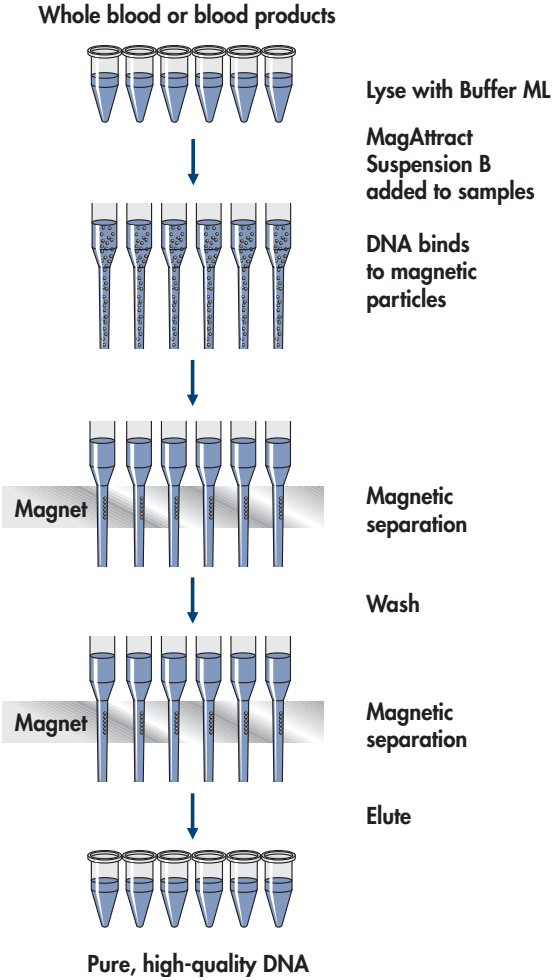

Table 1. Starting materials, elution volumes, and protocol times used in MagAttract DNA Blood M48 procedures

Sample type	Sample volume (µl)	Elution volume (µl)	Kit	Protocol	Setup and pretreatment (min)	Run time (min)*
Whole blood	100–200	50–400	Mini	200 µl Blood	10–15	23–159
Whole blood	250–350	100–400	Midi	350 µl Blood	10–15	28–204
Whole blood	500–700	200–400	Midi	700 µl Blood†	10–15	40–306
Buffy coat, enriched >9x‡§	50–75	150–400	Midi	75 µl Buffy Coat	10–45	24–175
Buffy coat, enriched ≤9x‡¶	100–150	150–400	Midi	150 µl Buffy Coat	10–45	24–175
Buffy coat with low leukocyte concentration‡**	200–300	150–400	Midi	300 µl Buffy Coat†	10–45	28–204

* Fully automated run times vary depending on the number of samples processed (6–48 samples).

† The MagAttract DNA Blood Midi M48 Kit (192) contains sufficient reagents for processing only 96 samples when using these protocols. These protocols are only recommended for samples with low concentrations of white blood cells.

‡ For each buffy coat protocol, the maximum number of cells to use as starting material is 5×10^6 cells.

§ For example, 1 ml leukocyte containing fraction harvested from 10 ml centrifuged whole blood = 10x enrichment.

¶ Recommended protocol for preparation of buffy coat.

** For example, from certain leukemia patients or other donors where leukocyte count is low.

Yield of purified DNA

DNA yields depend on the sample type, number of nucleated cells in the sample, and the protocol used for isolation of DNA. Table 2 shows typical yields obtained from different sample volumes and sample types. Elution in smaller volumes increases the final DNA concentration in the eluate, but slightly reduces overall DNA yield. We recommend using an elution volume appropriate for the intended downstream application.

Table 2. DNA yields obtained from whole blood and buffy coat using MagAttract DNA Blood M48 procedures

Sample type	Sample volume (µl)	DNA yield (µg)
Blood*	200	3.9–6.2
Blood†	350	4.8–11.2
Blood†	700	9–20
Buffy coat, enriched >9x‡	75	7.3–14.4
Buffy coat, enriched ≤9x	150	6.8–13.7
Buffy coat with low leukocyte concentration	300	Up to 13.4

* Whole blood with 4.5–7.7 x 10^6 white blood cells/ml; elution volume 200 µl.

† Whole blood with 3–8 x 10^6 white blood cells/ml; elution volume 200 µl.

‡ Prepared from blood bag, 10x enrichment. This type of buffy coat preparation tends to result in very efficient leukocyte enrichment.

Supplementary MagAttract M48 protocols for additional sample types

Supplementary protocols for automated purification of DNA from blood products and other tissue and cell types using the MagAttract DNA M48 System are available online at www.qiagen.com/literature/clinlit.asp.

Equipment and Reagents to Be Supplied by User

When working with chemicals, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, consult the appropriate safety data sheets (SDSs), available from the product supplier.

- BioRobot M48 workstation (cat. no. 9000708)
- App. Package, M48, Genotyping (cat. no. 9016146)
- Filter-Tips, 1000 µl, M48 (1000), cat. no. 995652
- Reagent Containers, small, M48 (100), cat. no. 995902
- Reagent Containers, large, M48 (50), cat. no. 995904
- Reagent Container Seals, M48 (50), cat. no. 995906
- Sample Prep Plates, 42-well, M48 (100), cat. no. 995908
- Required for the MagAttract DNA Blood Mini Kit — sample tubes, 1.5 ml, without lids (Sarstedt, cat. no. 72.696)* or with screw caps (Sarstedt, cat. no. 72.692)*
- Required for the MagAttract DNA Blood Midi Kit — sample tubes, 2 ml, without lids (Sarstedt, cat. no. 72.608)* or with screw caps (Sarstedt, cat. no. 72.693)*
- Elution tubes with screw caps, 1.5 ml (Sarstedt, cat. no. 72.692)*† or 2.0 ml (Sarstedt, cat. no. 72.693)*†
- Disposable gloves
- Ethanol (96–100%)

Optional:

- Cooling Block, 48-tube, 0.2 ml, M48, cat. no. 9015178
- Cooling Block, 48-tube, 1.4 ml, M48, cat. no. 9015180

* This is not a complete list of suppliers and does not include many important vendors of biological supplies; however, use of other tubes may result in an instrument crash.

† DNA can also be eluted into 0.2 ml thin-walled PCR tubes or 1.4 ml tubes.

Important Notes

Storage of blood samples

Whole blood samples treated with EDTA, ACD, or heparin can be used, and may be either fresh or frozen. Frozen samples should be thawed at room temperature (15–25°C) with mild agitation before beginning the procedure. Yield and quality of the purified DNA depend on storage conditions of the blood. Fresher blood samples may yield better results.

- For short-term storage (up to 10 days), collect blood in tubes containing EDTA as an anticoagulant, and store the tubes at 2–8°C. However, for applications requiring maximum fragment size, such as Southern blotting, we recommend storage at 2–8°C for up to 3 days only, as low levels of DNA degradation will occur after this time.
- For long-term storage, collect blood in tubes containing a standard anticoagulant (preferably EDTA, if high-molecular-weight DNA is required), and store tubes at –70°C.

Preparation of buffy coat

Buffy coat is a leukocyte-enriched fraction of whole blood. Prepare buffy coat by centrifuging whole blood* at 1100 x *g* for 10 minutes at room temperature (15–25°C). After centrifugation, 3 different fractions are distinguishable: the upper clear layer is plasma; the intermediate layer is buffy coat, containing concentrated leukocytes; and the bottom layer contains concentrated erythrocytes. Carefully transfer the middle layer containing the concentrated leukocytes to a new tube. Pipet as much of the gray-white interface as possible followed by equal portions of the layers directly over and under the interface. In some cases it may be helpful to carefully aspirate off part of the plasma layer before harvesting the leukocytes. A 1.8 ml whole blood sample should yield approximately 200 µl buffy coat. Scaling up the preparation (e.g., to obtain 1 ml buffy coat from 9 ml whole blood) may improve the efficiency of the leukocyte harvest. Buffy coat samples may be used immediately or stored at –20°C for purification of DNA at a later date. Frozen samples should be thawed at room temperature before beginning the procedure.

Buffer ML

Before use, check that Buffer ML does not contain a white precipitate by shaking the bottle. Check again when pipetting Buffer ML into the Reagent Container. If necessary, incubate for 30 minutes at 37°C with occasional shaking to dissolve precipitate. Between runs, store Buffer ML at room temperature (15–25°C).

* Whole blood samples containing a standard anticoagulant (EDTA, citrate, or heparin) should be used.

Buffer MW1

Add 26 ml of ethanol (96–100%) per bottle containing 77 ml of Buffer MW1 as described on the bottle. Tick the check box on the bottle to indicate that ethanol has been added. Between runs, store the reconstituted Buffer MW1 at room temperature (15–25°C).

Note: Always mix Buffer MW1 by shaking the bottle five times before starting the procedure.

MagAttract Suspension B

Shake the bottle containing MagAttract Suspension B and vortex for 3 minutes (before first use) or 1 minute (before subsequent uses) to ensure that the magnetic silica particles are fully resuspended.

Residual reagents

Residual reagents should either be removed immediately from the workstation and transferred to an airtight container, or discarded. Residual Buffer ML should always be discarded.

Quantification of DNA

Carryover of magnetic particles may affect the absorbance reading at 260 nm (A_{260}) of the purified DNA but should not affect downstream applications. The measured absorbance at 320 nm (A_{320}) should be subtracted from all absorbance readings. See "Quantification of DNA", Appendix, page 21 for more information.

Protocol: Purification of Total DNA from 200 µl Human Whole Blood using the MagAttract DNA Blood Mini M48 Kit

Important point before starting

- Supplementary protocols for automated purification of DNA from blood products using the MagAttract DNA Blood M48 Kit are available online at www.qiagen.com/literature/clinlit.asp.

Things to do before starting

- Thaw and equilibrate up to 48 whole blood samples at room temperature (15–25°C).
- Check that Buffer MW1 has been prepared according to the instructions on page 12.
- Before use, check that Buffer ML does not contain a white precipitate by shaking the bottle. Check again when pipetting Buffer ML into the Reagent Container. If necessary, incubate for 30 minutes at 37°C with occasional shaking to dissolve precipitate.

Procedure

1. **Place 200 µl of blood into 1.5 ml sample tubes.**
2. **Ensure that the BioRobot M48 is switched on.**

   The power switch is on the left side of the instrument.
3. **Switch on the computer and monitor.**
4. **Launch the QIAsoft M Operating System.**

   Upon startup, the computer controlling the BioRobot M48 is normally set to launch the QIAsoft M software startup window, but this setting may have been changed.

   The QIAsoft M Operating System can also be started from the QIAsoft M icon on the desktop or from the Microsoft® Windows® "Start" menu, where it is located in QIAsoft M Operating System → QIAsoft M V2.0 for BioRobot M48.
5. **Select the protocol group "Genotyping" from the drop-down menu, by clicking on the dark green arrow, then select "gDNA".**

6. **Select the protocol "200 µl Blood" and click the "Select" button to choose the elution tube type. Enter the number of samples, and sample and elution volumes into the software.**

   The QIAsoft M software will now guide you through the remaining steps required to set up the BioRobot M48 for the MagAttract DNA Blood Mini M48 Protocol; these steps include the option of entering names for your samples. Follow the steps detailed in each protocol message before continuing. Wear gloves when loading the required items on the worktable.

7. **Place the sample tubes on the worktable, plus reagent containers and plasticware, according to the software.**

8. **Close the workstation door and start the purification protocol. All steps are fully automated, and a software message on the screen will indicate when the protocol is finished.**

9. **Retrieve the elution tubes containing the purified DNA from the cooling block. The DNA is ready to use, or can be stored at 2–8°C for 24 h or at –20°C for longer periods.**

   If the purified DNA is to be analyzed by fluorescent capillary sequencing, tubes containing eluate should first be applied to a suitable magnetic separator and the eluate transferred to a clean tube (see Appendix, page 21) to minimize the risk of magnetic-particle carryover.

Protocol: Purification of Total DNA from 350 µl or 700 µl Human Whole Blood using the MagAttract DNA Blood Midi M48 Kit

Important point before starting

- Supplementary protocols for automated purification of DNA from blood products using the MagAttract DNA Blood Midi M48 Kit are available online at www.qiagen.com/literture/clinlit.asp.

Things to do before starting

- Thaw and equilibrate up to 48 whole blood samples at room temperature (15–25°C).
- Check that Buffer MW1 has been prepared according to the instructions on page 12.
- Before use, check that Buffer ML does not contain a white precipitate by shaking the bottle. Check again when pipetting Buffer ML into the reagent container. If necessary, incubate for 30 minutes at 37°C with occasional shaking to dissolve precipitate.

Procedure

1. **Place 350 µl or 700 µl of blood into 2 ml sample tubes.**

   Note: The MagAttract DNA Blood Midi M48 Kit (192) contains sufficient reagents for processing only 96 samples when using 700 µl of blood. This amount is only recommended for samples with low concentrations of white blood cells.

2. **Ensure that the BioRobot M48 is switched on.**

   The power switch is on the left side of the instrument.

3. **Switch on the computer and monitor.**

4. **Launch the QIAsoft M Operating System.**

   Upon startup, the computer controlling the BioRobot M48 is normally set to launch the QIAsoft M software startup window, but this setting may have been changed.

   The QIAsoft M Operating System can also be started from the QIAsoft M icon on the desktop or from the Microsoft Windows "Start" menu, where it is located in QIAsoft M Operating System → QIAsoft M V2.0 for BioRobot M48.

5. **Select the protocol group "Genotyping" from the drop-down menu, by clicking on the dark green arrow, then select "gDNA".**

6. **Select the protocol "350 µl Blood" or "700 µl Blood", depending on the sample volume chosen in step 1, and click the "Select" button to choose the elution tube type. Enter the number of samples, and sample and elution volumes into the software.**

   The QIAsoft M software will now guide you through the remaining steps required to set up the BioRobot M48 for the protocol; these steps include the option of entering names for your samples. Follow the steps detailed in each protocol message before continuing. Wear gloves when loading the required items on the worktable.

7. **Place the sample tubes on the worktable, plus reagent containers and plasticware, according to the software.**

8. **Close the workstation door and start the purification protocol. All steps are fully automated, and a software message on the screen will indicate when the protocol is finished.**

9. **Retrieve the elution tubes containing the purified DNA from the cooling block. The DNA is ready to use, or can be stored at 2–8°C for 24 h or at –20°C for longer periods.**

   If the purified DNA is to be analyzed by fluorescent capillary sequencing, tubes containing eluate should first be applied to a suitable magnetic separator and the eluate transferred to a clean tube (see Appendix, page 21) to minimize the risk of magnetic-particle carryover.

Protocol: Purification of Total DNA from Buffy Coat using the MagAttract DNA Blood Midi M48 Kit

Important points before starting

- Supplementary protocols for automated purification of DNA from blood products using the MagAttract DNA Blood Midi M48 Kit are available online at www.qiagen.com/literture/clinlit.asp.

Things to do before starting

- Prepare or thaw and equilibrate (at room temperature, 15–25°C) up to 48 buffy coat samples (see "Preparation of buffy coat", page 11).
- Check that Buffer MW1 has been prepared according to the instructions on page 12.
- Before use, check that Buffer ML does not contain a white precipitate by shaking the bottle. Check again when pipetting Buffer ML into the reagent container. If necessary, incubate for 30 minutes at 37°C with occasional shaking to dissolve precipitate.

Procedure

1. **Pipet 50–300 µl buffy coat (depending on the type of buffy coat sample used, see Table 1, page 8) into 2 ml sample tubes. Thawed buffy coat samples should be resuspended thoroughly before pipetting.**
2. **Ensure that the BioRobot M48 is switched on.**

   The power switch is on the left side of the instrument.
3. **Switch on the computer and monitor.**
4. **Launch the QIAsoft M Operating System.**

   Upon startup, the computer controlling the BioRobot M48 is normally set to launch the QIAsoft M software startup window, but this setting may have been changed.

   The QIAsoft M Operating System can also be started from the QIAsoft M icon on the desktop or from the Microsoft Windows "Start" menu, where it is located in QIAsoft M Operating System → QIAsoft M V2.0 for BioRobot M48.
5. **Select the protocol group "Genotyping" from the drop-down menu, by clicking on the dark green arrow, then select "gDNA".**

6. **Select the protocol "75 µl Buffy Coat", "150 µl Buffy Coat", or "300 µl Buffy Coat", depending on the sample volume chosen in step 1. Click the "Select" button to choose the elution tube type. Enter the number of samples, and sample and elution volumes into the software.**

   The QIAsoft M software will now guide you through the remaining steps required to set up the BioRobot M48 for the protocol; these steps include the option of entering names for your samples. Follow the steps detailed in each protocol message before continuing. Wear gloves when loading the required items on the worktable.

7. **Place the sample tubes on the worktable, plus reagent containers and plasticware, according to the software.**

8. **Close the workstation door and start the purification protocol. All steps are fully automated, and a software message on the screen will indicate when the protocol is finished.**

9. **Retrieve the elution tubes containing the purified DNA from the cooling block. The DNA is ready to use, or can be stored at 2–8°C for 24 h or at –20°C for longer periods.**

   If the purified DNA is to be analyzed by fluorescent capillary sequencing, tubes containing eluate should first be applied to a suitable magnetic separator and the eluate transferred to a clean tube (see Appendix, page 21) to minimize the risk of magnetic-particle carryover.

Troubleshooting Guide

This troubleshooting guide may be helpful in solving any problems that may arise. For more information, see also the Frequently Asked Questions page at our Technical Support Center: www.qiagen.com/FAQ/FAQList.aspx. The scientists in QIAGEN Technical Services are always happy to answer any questions you may have about either the information and protocols in this handbook or sample and assay technologies (for contact information, see back cover or visit www.qiagen.com).

	Comments and suggestions
General handlingg	
QIAsoft M software error dialog box	If the QIAsoft M software displays an error dialog box during a protocol run, refer to the Troubleshooting Guide in the *BioRobot M48 User Manual*.
Low DNA yield	
a) Incomplete sample lysis	Before use, check that Buffer ML does not contain a white precipitate by shaking the bottle. Check again when pipetting Buffer ML into the Reagent Container. If necessary, incubate for 30 min at 37°C with occasional shaking to dissolve precipitate.
b) MagAttract Suspension B was not completely resuspended	Before starting the procedure, ensure that the MagAttract Suspension B is fully resuspended. Vortex for at least 3 min before first use, and for 1 min before subsequent uses.
c) Buffer MW1 did not contain ethanol	Ensure that the correct volume of ethanol was added to Buffer MW1. Repeat the purification procedure with new samples.
d) Frozen samples were not mixed properly after thawing	Thaw frozen blood or buffy coat samples at room temperature (15–25°C) with mild agitation to ensure thorough mixing.
e) Reagents were loaded onto worktable in wrong order	Ensure that all reagents were loaded onto the worktable in the correct order. Repeat the purification procedure with new samples.

	Comments and suggestions
f) Clogging of pipet tip due to sample overload	Reduce the sample input volume. The 700 µl Blood protocol is only recommended for samples with low concentrations of white blood cells. The maximum recommended amount of buffy coat cells to use as staring material is 5×10^6 cells.
g) **Buffy coat protocol**: Poor buffy coat preparation	Ensure that the leukocyte fraction is harvested efficiently.
h) **Buffy coat protocol**: Low leukocyte count in the whole blood sample	Increase whole blood amount and keep the volume of leukocytes harvested constant.
DNA does not perform well in downstream applications	
a) Insufficient DNA used in downstream application	Quantify the purified DNA by spectrophotometric measurement of the absorbance at 260 nm (see "Quantification of DNA", Appendix, page 21).
b) Excess DNA used in downstream application	Excess DNA can inhibit some enzymatic reactions. Quantify the purified DNA by spectrophotometric measurement of the absorbance at 260 nm (see "Quantification of DNA", Appendix, page 21).
A_{260}/A_{280} ratio for purified DNA is low	
a) Buffer MW1 did not contain ethanol	Ensure that the correct volume of ethanol was added to Buffer MW1. Repeat the purification procedure with new samples.
b) Absorbance reading at 320 nm was not subtracted from the absorbance readings at 260 nm and 280 nm	To correct for the presence of magnetic particles in the eluate, an absorbance reading at 320 nm should be taken and subtracted from the absorbance readings obtained at 260 nm and 280 nm (see "Quantification of DNA", Appendix, page 21).

Appendix: Storage, Quantification, and Determination of Purity of DNA

Storage of DNA

Purified DNA may be stored at 2–8°C for 24 hours or at –20°C for longer storage.

Quantification of DNA

The concentration of DNA should be determined by measuring the absorbance at 260 nm (A_{260}) in a spectrophotometer. Absorbance readings at 260 nm should fall between 0.1 and 1.0 to be accurate. An absorbance of 1 unit at 260 nm corresponds to 50 µg of DNA per milliliter (A_{260} = 1 → 50 µg/ml). Use water to dilute the samples and to calibrate the spectrophotometer. The ratio between the absorbance values at 260 nm and 280 nm gives an estimate of DNA purity (see "Purity of DNA"). Carryover of magnetic particles in the eluate may affect the A_{260} reading, but should not affect the performance of the DNA in downstream applications. If the purified DNA is to be analyzed by fluorescent capillary sequencing, the tube containing the eluate should first be applied to a suitable magnetic separator and the eluate transferred to a clean tube (see below).

To quantify DNA purified using the MagAttract DNA M48 System:

- Apply the tube containing the DNA to a suitable magnetic separator (e.g., QIAGEN 12-Tube Magnet, cat. no. 36912) for 1 minute.
- If a suitable magnetic separator is not available, centrifuge the tube containing the DNA for 1 minute at full speed in a microcentrifuge to pellet any remaining magnetic particles.
- Once separation is complete, carefully withdraw 10–50 µl of purified DNA and dilute to a final volume of 100 µl in water.
- Measure the absorbance at 320 nm, 280 nm, and 260 nm. Subtract the absorbance reading obtained at 320 nm from the readings obtained at 260 nm and 280 nm to correct for the presence of magnetic particles.

Concentration of DNA sample = 50 µg/ml x ($A_{260} - A_{320}$) x dilution factor

Total amount of DNA purified = concentration x volume of sample in milliliters

Purity of DNA

Purity is determined by calculating the ratio of corrected absorbance at 260 nm to corrected absorbance at 280 nm i.e., ($A_{260} - A_{320}$)/($A_{280} - A_{320}$). Pure DNA has an A_{260}/A_{280} ratio of 1.7–1.9.

Ordering Information

Product	Contents	Cat. no.
MagAttract DNA Blood Mini M48 Kit (192)	MagAttract Suspension B and buffers for up to 192 x 200 µl preps	951336
MagAttract DNA Blood Midi M48 Kit (192)	MagAttract Suspension B and buffers for up to 192 x 350 µl preps	951356
App. Package, M48, Genotyping	Software protocol package for genotyping applications on the BioRobot M48 workstation	9016146
Starter Pack, M48	Pack includes: sterile filter-tips (600); sample preparation plates (40); large reagent containers (8); small reagent containers (8); silicon seals (8); sample tubes, 1.5 ml (250); sample tubes, 2.0 ml (250); elution tubes, screw cap, 1.5 ml (250); tip waste bags (2)	995999
Filter-Tips, 1000 µl, M48 (1000)	Sterile, disposable filter-tips, bagged; pack of 1000	995652
Reagent Containers, small, M48 (100)	Reagent containers (20 ml) with lids. To be used with the reagent container rack, M48; pack of 100	995902
Reagent Containers, large, M48 (50)	Reagent containers (100 ml) with lids. To be used with the reagent container rack, M48; pack of 50	995904
Reagent Container Seals, M48 (50)	Lid-sealing strips for small and large reagent containers, allowing storage of unused reagents; pack of 50	995906
Sample Prep Plates, 42-well, M48 (100)	Disposable polypropylene plates for sample preparation, including nucleic acid binding and washing steps; pack of 100	995908
12-Tube Magnet	Magnet for separating magnetic particles in 12 x 1.5 ml or 2 ml tubes	36912

Ordering Information

Product	Contents	Cat. no.
Related products		
MagAttract DNA Mini M48 Kit (192)	MagAttract Suspension B and buffers for up to 192 preps	953336
App. Package, M48, Genomic Research	Software protocol package for genomic research applications on BioRobot M48 workstation	9016148
App. Package, M48, Genetic Screening	Software protocol package for genetic screening applications on the BioRobot M48 workstation	9016147
App. Package, M48, Pathology	Software protocol package for pathology applications on the BioRobot M48 workstation	9016151
App. Package, M48, Infectious Disease	Software protocol package for infectious disease applications on the BioRobot M48 workstation	9016145

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

Notes

Notes

Notes

Trademarks:

QIAGEN®, BioRobot®, MagAttract® (QIAGEN Group); Microsoft®, Windows® (Microsoft Corporation).

Limited License Agreement for MagAttract DNA Blood M48 Kit

Use of this product signifies the agreement of any purchaser or user of the product to the following terms:

1. The product may be used solely in accordance with the protocols provided with the product and this handbook and for use with components contained in the kit only. QIAGEN grants no license under any of its intellectual property to use or incorporate the enclosed components of this kit with any components not included within this kit except as described in the protocols provided with the product, this handbook, and additional protocols available at www.qiagen.com. Some of these additional protocols have been provided by QIAGEN users for QIAGEN users. These protocols have not been thoroughly tested or optimized by QIAGEN. QIAGEN neither guarantees them nor warrants that they do not infringe the rights of third-parties.
2. Other than expressly stated licenses, QIAGEN makes no warranty that this kit and/or its use(s) do not infringe the rights of third-parties.
3. This kit and its components are licensed for one-time use and may not be reused, refurbished, or resold.
4. QIAGEN specifically disclaims any other licenses, expressed or implied other than those expressly stated.
5. The purchaser and user of the kit agree not to take or permit anyone else to take any steps that could lead to or facilitate any acts prohibited above. QIAGEN may enforce the prohibitions of this Limited License Agreement in any Court, and shall recover all its investigative and Court costs, including attorney fees, in any action to enforce this Limited License Agreement or any of its intellectual property rights relating to the kit and/or its components.

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