

INSTRUCTION FOR USE

chemagic™ BBS DNA Kit H96

Product number: IVD-1091

Reagents for 960 extractions.

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Version: V251217 EN

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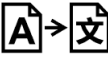
FOR *IN VITRO* DIAGNOSTIC USE.

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2. SYMBOLS USED IN THE IFU AND ON LABELS

Symbol	Symbol Title	Symbol	Symbol Title
	CE mark European conformity		Temperature limit
	<i>In vitro</i> medical device		Contains sufficient for <n> tests
	Consult instructions for use or electronic instructions for use		Quantity
	Manufacturer		Do not re-use
	Batch code		Translation
	Catalogue number		Use-by date
	Do not use if package is damaged and consult instructions for use		This way up
	GHS02		Dangerous goods: Class 3 Flammable liquid
	GHS07		Dangerous goods: Class 8 Corrosive substances
	GHS08	-	-

3. EXPLANATION OF THE SIGNAL WORDS IN THIS IFU

Signal word	Description
CAUTION!	Potential hazard that could lead to slight or medium harm.
ATTENTION!	Improper handling can damage the instrument.
NOTE:	Errors committed by the operator can cause that the optimal performance of the kit cannot be guaranteed.

4. TRADEMARKS

Revvity is a trademark of Revvity Inc. All other trademarks are the property of their respective owners.

chemagic™ is a trademark of Revvity chemagen Technologie GmbH.

5. INTENDED PURPOSE

The chemagic™ BBS DNA Kit H96 (IVD-1091) is a kit for the automated isolation and purification of DNA from human blood, buffy coats (blood with reduced amount of plasma) and stabilized saliva for *in vitro* diagnostic purposes.

Other sample materials such as swabs or tissue lysates may be compatible but have not yet been validated. For such materials, validation must be performed by the user.

The product is used on the chemagic™ 360-D instrument and is intended for laboratory personnel trained for the chemagic 360-D instrument in combination with chemagic nucleic acid purification kits. The kit is designed to be used with IVD downstream applications employing enzymatic amplification and detection of DNA (e.g. PCR, RT-PCR, NGS).

For further information please refer to the sections “KIT REAGENTS AND SAFETY INFORMATION” and “WARNINGS AND PRECAUTION” in this document.

6. SUMMARY AND PRINCIPLE

The chemagic BBS DNA Kit H96 is based on a magnetic bead technology platform proprietary to Revvity chemagen Technologie GmbH. White blood cells or other sources of DNA present in blood, buffy coat and saliva are lysed during the extraction process. The released nucleic acids bind to small magnetizable particles which are then magnetically separated from the sample material. During subsequent steps contaminants are removed and the purified nucleic acids are transferred into an elution buffer. The automated sample processing is performed using the chemagic 360-D instrument with a chemagic 96 Rod Head Set or equivalent instrument.

To minimize irregularities in diagnostic results, the product is intended to be used with appropriate controls throughout the process of sample preparation, sample amplification and detection according to the downstream assay used.

7. REPORTING OF INCIDENTS

For a user/ third party in the European Union and in countries with an identical regulatory regime (IVDR (EU) 2017/746); if, during the use of this device or as a result of its use, a serious incident has occurred, please report it to your national authority and to the manufacturer Revvity chemagen Technologie GmbH, +49 (0) 2401805500 or support.chemagen@revvity.com or it's legal representatives.

The competent authority in Germany is the Federal Institute for Drugs and Medical Devices (Bundesinstitut für Arzneimittel und Medizinprodukte, BfArM). Current contact information can be found on the BfArM website: <https://www.bfarm.de>.

8. GENERAL AND STORAGE INFORMATION

The kit contains reagents sufficient to perform 960 extractions.

The expiry date of the unopened kit is stated on the outer label. Do not use any component beyond the expiry date. Store at +2 to +25 °C.

Once opened, the kit components have limited stability. The stability after opening is stated for each component separately in the reagent listing below (section “KIT REAGENTS AND SAFETY INFORMATION”).

NOTE: Recap the bottles tightly immediately after use to prevent evaporation.

The bottles may discolor during storage. The discoloration of the bottles has no effect on the functionality of the assay.

In some cases, traces of Magnetic Beads may be left in the eluate. Though such particles will usually not interfere with PCR or most downstream applications, an additional separation step either using centrifugation or a magnetic separator (chemagic Stand 96, provided with the chemagic 360 96 Rod Head Set) is recommended, to separate any traces of particles.

Extracted DNA should be used immediately after extraction in the desired *in vitro* diagnostic test.

In this IFU we refer to the chemagic 360-D User Manual. This manual will be provided with the chemagic 360-D instrument.

Kit-related protocol files are available on the Revvity website or will be provided by customer support (see section “REQUIRED PROTOCOL FILES”).

9. ELECTRONIC INSTRUCTIONS FOR USE

Electronic Instructions for Use (eIFU) in different languages are available on the Revvity website.

To download these electronic Instructions for Use please visit:

<https://www.revvity.com/de-en/product/chemagic-bbs-dna-kit-h96-ivd-1091>.

The eIFU are provided in at least English (EN), French (FR), Spanish (ES) and Italian (IT) and upon request also in other required languages.

In case of any questions regarding download or the electronic Instructions for Use please contact us: support.chemagen@revvity.com, info.chemagen@revvity.com or +49 (0) 2401805500.

10. WARNINGS AND PRECAUTION

For *in vitro* diagnostic use.

The product is intended for laboratory personnel trained for the chemagic 360-D instrument in combination with chemagic nucleic acid purification kits.

A thorough understanding of this IFU and the chemagic 360-D User Manual is a prerequisite and necessary for successful use of the chemagic BBS DNA Kit H96.

The reagents supplied with this kit are intended for use as an integral unit. Do not mix identical reagents from kits with different lot numbers.

Do not use kit reagents after the expiry date printed on the kit label. Once opened, the reagents can be used for the period stated in the reagent listing of this IFU.

Any deviation from the protocol may affect the results.

The reagents are automatically dispensed in whole rows and therefore the disposable tips in the chemagic Tips 96 Tray should be used also in whole rows on each rod in contact with any reagent solution.

It should also be noted that if partial plates are run, the solutions may not be sufficient for 960 extractions.

Check all kit components for integrity. In case of damage, contact your supplier.

Handle all specimens as potentially infectious. Potentially infectious samples shall be inactivated. Please refer to the U.S. Department of Health and Human Services publication "Biosafety in Microbiological and Biomedical Laboratories" or any other local or national regulation.

Lysis Buffer 1 contains guanidinium chloride and is harmful if swallowed, in contact with skin or if inhaled. Binding Buffer 2, Wash Buffer 3 and Wash Buffer 4 contain sodium perchlorate and ethanol and are flammable liquids and vapors and are harmful if swallowed. Wash Buffer 5 contains ethanol and is a flammable liquid and vapor. Proteinase K contains *Engyodontium album* serine protease and causes skin irritation and serious eye irritation. It may cause allergy or asthma symptoms or breathing difficulties or respiratory irritation if inhaled. See specific precautions for all components in the section "KIT REAGENTS AND SAFETY INFORMATION".

To avoid injuries when working with the kit components, always wear safety glasses, disposable gloves, and protective clothing. For detailed information, please refer to the corresponding safety data sheets (SDS) available on the Revvity website.

Follow local regulations for handling ethanolic solutions.

Disposal of all waste should be in accordance with local regulations.

11. KIT REAGENTS AND SAFETY INFORMATION

The chemagic BBS DNA Kit H96 contains the following reagents.

11.1 MAGNETIC BEADS

Component	Quantity	Shelf life and storage
Magnetic Beads	1 bottle (volume: see label)	+2 to +25 °C until expiry date stated on the bottle label. Once opened, stable for 60 days at +2 to +25 °C.

Suspension of particles containing nanoparticulate iron oxide encapsulated in a matrix of polyvinyl alcohol.

Magnetic Beads bind the DNA during the extraction process.

11.2 LYSIS BUFFER 1

Component	Quantity	Shelf life and storage
Lysis Buffer 1 	1 bottle (volume: see label)	+2 to +25 °C until expiry date stated on the bottle label. Once opened, stable for 60 days at +2 to +25 °C.

WARNING

Ready-for-use aqueous buffer (pH 6.7-7.2) solution containing guanidinium chloride (40-60 %) and isotridecyl alcohol (0-2 %).

Lysis Buffer 1 is used to lyse the cells or other DNA source present in the sample to release DNA in solution.

CAUTION! Lysis Buffer 1 contains guanidinium chloride and isotridecyl alcohol.

Hazard, precautionary and EUH phrases	
H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
P280	Wear eye protection/ face protection.
P301+P312	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P330	Rinse mouth.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332+P313	If skin irritation occurs: Get medical advice/ attention.
P501	Dispose of contents/ container in accordance with local/ regional/ national/ international regulations.

11.3 BINDING BUFFER 2

Component	Quantity	Shelf life and storage
Binding Buffer 2 	1 canister (volume: see label)	+2 to +25 °C until expiry date stated on the canister label. Once opened, stable for 60 days at +2 to +25 °C.
DANGER		

Ready-for-use Tris-HCl-buffered (pH 5.2-5.9) solution with sodium perchlorate (30-50 %), ethanol (30-50 %) and acetic acid (0-2 %).

Binding Buffer 2 is used to create the appropriate conditions to get the DNA bound to the Magnetic Beads.

CAUTION! Binding Buffer 2 contains ethanol and sodium perchlorate.

Hazard, precautionary and EUH phrases	
H226	Flammable liquid and vapor.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ ventilating/ lighting] equipment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P501	Dispose of contents/ container in accordance with local/ regional/ national/ international regulations.

11.4 WASH BUFFER 3

Component	Quantity	Shelf life and storage
Wash Buffer 3 	1 canister (volume: see label)	+2 to +25 °C until expiry date stated on the canister label. Once opened, stable for 60 days at +2 to +25 °C.
DANGER		

Ready-for-use Tris-HCl-buffered (pH 5.0-5.6) solution with sodium perchlorate (20-40 %) and ethanol (20-40 %).

Wash Buffer 3 is used for removing non-DNA contaminants during washing step.

CAUTION! Wash Buffer 3 contains ethanol and sodium perchlorate.

Hazard, precautionary and EUH phrases	
H226	Flammable liquid and vapor.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ ventilating/ lighting] equipment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P501	Dispose of contents/ container in accordance with local/ regional/ national/ international regulations.

11.5 WASH BUFFER 4

Component	Quantity	Shelf life and storage
Wash Buffer 4 	1 canister (volume: see label)	+2 to +25 °C until expiry date stated on the canister label. Once opened, stable for 60 days at +2 to +25 °C.
DANGER		
Ready-for-use Tris-HCl-buffered (pH 5.0-5.6) solution with sodium perchlorate (20-40 %) and ethanol (20-40 %). Wash Buffer 4 is used for removing non-DNA contaminants during washing step.		
CAUTION! Wash Buffer 4 contains ethanol and sodium perchlorate.		
Hazard, precautionary and EUH phrases		
H226	Flammable liquid and vapor.	
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.	
P240	Ground and bond container and receiving equipment.	
P241	Use explosion-proof [electrical/ ventilating/ lighting] equipment.	
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.	
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].	
P501	Dispose of contents/ container in accordance with local/ regional/ national/ international regulations.	

11.6 WASH BUFFER 5

Component	Quantity	Shelf life and storage
Wash Buffer 5 	1 canister (volume: see label)	+2 to +25 °C until expiry date stated on the canister label. Once opened, stable for 60 days at +2 to +25 °C.
DANGER		

Ready-for-use solution contains ethanol (50-70 %).

Wash Buffer 5 is used for removing last traces of non-DNA contaminants during washing step.

CAUTION! Wash Buffer 5 contains ethanol.

Hazard, precautionary and EUH phrases	
H225	Highly flammable liquid and vapor.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ ventilating/ lighting] equipment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P501	Dispose of contents/ container in accordance with local/ regional/ national/ international regulations.

11.7 WASH BUFFER 6

Component	Quantity	Shelf life and storage
Wash Buffer 6	1 canister (volume: see label)	+2 to +25 °C until expiry date stated on the canister label. Once opened, stable for 60 days at +2 to +25 °C.

Ready-for-use ultra-filtered water solution.

Wash Buffer 6 is used for removing possible residuals of ethanol.

11.8 ELUTION BUFFER 7

Component	Quantity	Shelf life and storage
Elution Buffer 7	2 bottles (volume see label)	+2 to +25 °C until expiry date stated on the bottle label. Once opened, stable for 60 days at +2 to +25 °C.

Ready-for-use 10 mM Tris-HCl-buffered (pH 7.8–8.4) solution.

Elution Buffer 7 is used for releasing nucleic acids.

11.9 PROTEINASE K

Component	Quantity	Shelf life and storage
Proteinase K   DANGER	9 glass vials (lyophilized)	+2 to +25 °C until expiry date stated on the vial label. Once reconstituted, stable for 28 days at +2 to +8 °C.

Proteinase K is reconstituted by adding 1.25 mL of purified water.

Proteinase K is added to enhance the efficiency of the lysis step.

CAUTION! Proteinase K contains sodium acetate and is a recombinant serine protease from fungus *Engyodontium album*.

Hazard, precautionary and EUH phrases	
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P280	Wear eye protection/ face protection.
P284	[In case of inadequate ventilation] wear respiratory protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405	Store locked up.
P501	Dispose of contents/ container in accordance with local/ regional/ national/ international regulations.

11.10 FURTHER KIT COMPONENTS

The chemagic BBS DNA Kit H96 contains the following plastic material.

Component	Quantity	Storage
chemagic Tips 96 Tray	10	+2 to +25 °C
chemagic Deep Well Plate 2 mL	62	+2 to +25 °C
chemagic Low Well Plate	10	+2 to +25 °C

12. REQUIRED PROTOCOL FILES

The following protocol files will be provided by Revvity chemagen Technologie GmbH and are available on the Revvity website (<https://www.revvity.com/de-en/software-downloads/chemagic>) or will be provided by customer support.

Protocol file (.che file)	Protocol type/purpose
chemagic BBS DNA 360 H96 prefilling VD190913.che	Kit-related extraction file for the chemagic 360-D instrument.
prime manifolds H96 all 360 V150116.che	Filling and priming the chemagic 360-D instrument tubing with reagents.
check manifolds H96 all 360 V150116.che	Checking the functionality of the pumps.
regular cleaning procedure 96 dispenser 360 V150116.che	Regular cleaning of the chemagic 360-D instrument (once per week).
intensive cleaning procedure H96 dispenser 360 V150116.che	Intensive cleaning of the chemagic 360-D instrument (once per month).

13. MATERIAL REQUIRED BUT NOT SUPPLIED WITH THE KIT

The chemagic BBS DNA Kit H96 requires the following items.

13.1 ITEMS FROM REVVITY CHEMAGEN TECHNOLOGIE GMBH

Item	Product no.
chemagic 360-D instrument	2024-0010
chemagic 96 Rod Head Set	CMG-370

13.2 ADDITIONAL REQUIRED ITEMS

Item	Purpose
Pipettes and pipette tips with aerosol barriers	Prefilling of Magnetic Beads, Elution Buffer 7 and Proteinase K.
Molecular biology grade water	Reconstitution of the Proteinase K.
70% Ethanol	Cleaning of the chemagic 360-D instrument.

13.3 ADDITIONAL OPTIONAL ITEMS FROM REVVITY CHEMAGEN TECHNOLOGIE GMBH

Item	Product no.
chemagic Stand 96 (supplied with the chemagic 96 Rod Head Set)	CMG-301
Red Cell Lysis Buffer	CMG-848

13.4 OTHER ADDITIONAL OPTIONAL ITEMS

Item	Purpose
Isotonic saline solution, sterile	Resuspension of buffy coats.

14. SPECIMEN COLLECTION AND HANDLING

The chemagic BBS DNA Kit H96 is usable with human blood, buffy coat and saliva in aliquots of 250 - 400 µL per isolation.

Human whole blood (250 - 400 µL) or buffy coat samples (up to 400 µL from up to 2 mL blood) that are fresh, frozen or stored typically for a maximum of 10 days from +2 to +8 °C should be used. For long-term storage, freezing at –20 °C or –80 °C in aliquots is recommended. The recommended blood stabilizers are EDTA or citrate.

NOTE: The use of heparin-stabilized blood samples can cause inhibition in downstream applications and is therefore not recommended.

The white blood cell count in the whole blood sample decreases during storage. Prolonged storage of the samples may cause a poor yield of the DNA after extraction.

Human saliva (400 µL) stored according to the collection tube provider instructions should be used. The recommended stabilized collection tubes are from DNAgenotek®, Isohelix™ and Spectrum Solutions. Incubation of the collection tubes prior to the extraction for > 2 h at 50 °C will result in higher DNA yields and is therefore recommended.

Buffy coat samples stored for a maximum of one week from +2 to +8 °C should be used. For long-term storage, freezing at –20 °C or –80 °C in aliquots is recommended. The buffy coats should be derived from stabilized blood tubes (follow tube recommendation above for blood samples). Prior to the extraction, buffy coats should be thawed at 37 °C. We recommend the following procedure for the buffy coat preparation.

15. PREPARATION OF BUFFY COAT SAMPLES

- Add 2 mL of fresh whole blood into a sterile 50 mL tube.
- Add 15 mL Red Cell Lysis Buffer (RCLB) to the blood and invert the tube 4 times.
- Incubate for 5 minutes or until the suspension becomes translucent.
- Centrifuge at 4,000 rpm for 10 minutes to collect the white blood cells.
- Decant the supernatant and carefully aspirate the remaining supernatant from the top of the sample by pipetting.

NOTE: Be careful not to disturb the cell pellet. Exercise caution in pipetting to avoid loss of the white blood cell pellet.

- Add 10 mL Red Cell Lysis Buffer and carefully wash and remove the remaining red cells on top of the white pellet without disturbing the white pellet.
- Decant the supernatant and carefully aspirate the remaining supernatant from the top of the sample by pipetting.
- Resuspend the buffy coat in 400 µL isotonic saline solution (0.9 % NaCl).
- If the starting volume of blood is less than 2 mL, change the volume of Red Cell Lysis Buffer used proportionately.
- The buffy coats can be frozen, stored from +2 to +8 °C for one week, or directly used for extraction.

16. DETAILED PROTOCOL DESCRIPTION

16.1 PROTOCOL PROCEDURE

The following procedure describes the preparation and the execution of the extraction protocol using the chemagic 360-D instrument.

The duration of the automated extraction protocol is approximately 79 minutes.

The protocol is suitable for processing up to 96 samples in parallel (see “PROCESSING STEPS” below). For detailed instructions on the use of the chemagic 360-D instrument, please refer to the chemagic 360-D User Manual.

NOTE: Samples and reagents must be brought to room temperature (+19 to +25 °C) before use.

Connect the reagent bottles to the chemagic 360-D instrument as follows:

Pump	Buffer	Minimum filling volume
Pump 1	Lysis Buffer 1	125 mL
Pump 2	Binding Buffer 2	180 mL
Pump 3	Wash Buffer 3	180 mL
Pump 4	Wash Buffer 4	180 mL
Pump 5	Wash Buffer 5	180 mL
Pump 6	Wash Buffer 6	180 mL

NOTE: Recap the bottles tightly immediately after use or keep the bottles connected tightly to the chemagic 360-D instrument. Binding Buffer 2, Wash Buffer 3, Wash Buffer 4 and Wash Buffer 5 contain ethanol. If ethanol evaporates, the optimal yield or detection sensitivity cannot be guaranteed.

16.2 PROCESSING STEPS

1. Check all kit components for integrity. In case of damage, contact your supplier.
2. Before prefilling the plates mark each plate with material in position (samples, Magnetic Beads and buffers).

NOTE: The reagents are automatically dispensed in whole rows and therefore the tips should be used also in whole rows on each rod in contact with any reagent solution. Please note if partial plates are run, the solutions may not be sufficient for 960 extractions.

3. Reconstitute the Proteinase K:

Component	Reconstitution
Proteinase K	Add 1.25 mL molecular biology grade water to Proteinase K bottle and mix gently until dissolved.

4. Fill and prime the chemagic 360-D tubing with reagents by choosing the protocol **“prime manifolds H96 all 360 V150116.che”**. Press [Insert IDs], follow the instructions given in the chemagic QA software and start priming by pressing [OK]. If functions enabling the ID data input are deactivated, start priming directly by pressing [Start].

NOTE: Priming needs to be done when reagent bottles are connected to the chemagic 360-D instrument for the first time or when the instrument's tubing is not already filled with the above-mentioned reagents.

5. If priming is not needed, select the protocol **“check manifolds H96 all 360 V150116.che”** and press [Insert IDs] or - if the enhanced functions are deactivated - [Start]. A small volume of buffers will be dispensed by each pump sequentially starting with the first pump used for this application. If one of the pumps does not show dispensing of buffer through all nozzles, please use the corresponding priming protocol for this pump. Performing several runs a day it is only necessary to check the pumps once at the beginning of the day.
6. Select the protocol **“chemagic BBS DNA 360 H96 prefilling VD190913.che”** and press [Insert IDs] and follow the instructions given in the chemagic QA software.
7. Ensure chemagic Tips 96 Tray contains enough tips and is aligned with the positions of the samples and place the chemagic Tips 96 Tray in position 1 on the tracking system. The reagents are automatically dispensed in whole rows and therefore the tips should be used also in whole rows on each rod in contact with any reagent solution.

8. Check the volumes in the buffer supply containers and confirm by pressing [OK]. See above "PROTOCOL PROCEDURE" minimum filling volume.

NOTE: Take care that all buffer supply bottles contain enough buffer. Only if the liquid level for all buffers is sufficient 96 isolations can be performed.

9. Select the number of samples for prefilling by using the drop down menu. The scheme for positioning the samples will be shown after selection. Take care to use the given positions. Confirm by pressing [OK].
10. Prefill the selected wells of the sample plate with up to 400 µL sample. To ensure the homogeneity of the samples, mix the samples gently prior to pipetting in the sample plate.
11. Prefill Elution Buffer 7 (chemagic Deep Well Plate 2 mL) and the thoroughly resuspended Magnetic Beads (chemagic Low Well Plate) in the corresponding plates by pipetting manually according to each corresponding well in use.

Component	Plate position on chemagic 360-D instrument	Volume/well
Magnetic Beads	2	100 µL
Elution Buffer 7	8	100 – 300 µL

NOTE: The Magnetic Bead suspension should be mixed vigorously before dispensing; otherwise, the suspension is not homogenous, and the DNA yield could be low.

12. Add 10 µL Proteinase K to the wells containing sample.
13. Place the chemagic Deep Well Plates 2 mL and the chemagic Low Well Plate on the tracking system according to the instructions given by the chemagic QA software.
14. Place the sample plate in position 3 on the tracking system.
15. Check all plates for accurate orientation and fitting.
16. Close the front door and start the process by pressing [Start].
17. The automated DNA extraction process is initiated.

18. After the isolation procedure has finished use the [Turn Table] button to unload the tracking system. Each click on [Turn Table] moves the tracking system (table) clockwise by one position.

ATTENTION! Never move the tracking system (table) manually. This might damage the instrument. All movements must be performed with the [Turn Table] function.

NOTE: Opening the chemagic 360-D instrument door while the automated extraction run is ongoing, will terminate the run and the samples in process may be lost.

For information on cleaning the instrument see section "CLEANING AND MAINTENANCE".

16.3 SHORT DESCRIPTION/QUICK GUIDE

Automated DNA extraction run on chemagic 360-D instrument:

- Select the protocol “**check manifolds H96 all 360 V150116.che**” to flush the tubing prior to starting the automated extraction run.
- Press [Insert IDs], follow the instructions given in the chemagic QA software and start flushing by pressing [OK].
- When using the functions enabling the ID data input, select the protocol “**chemagic BBS DNA 360 H96 prefilling VD190913.che**” and press [Insert IDs]. Follow the instructions given in the chemagic QA software to fill in the required data.
- Load the plates and the chemagic Tips 96 Tray on the tracking system positions 1-8 as shown in the following overview.
(Numbers on tracking system refer to the positioning of the plates on the chemagic 360-D instrument.)
- Check all plates for accurate orientation and fitting.
- After all plates are in place, press [OK].
- Close the front door and start the DNA extraction process immediately by pressing [Start]. Subsequently the sample lysate will be mixed automatically.
- If the functions enabling the ID data input are deactivated, load the plates on the tracking system positions 1-8.
- After all plates are in place, select the protocol “**chemagic BBS DNA 360 H96 prefilling VD190913.che**”, mark the columns in use on the plate map in the dialog and start the extraction run directly by pressing [Start].
- After the isolation procedure has finished use the [Turn Table] button to unload the tracking system. Each click on [Turn Table] moves the tracking system (table) clockwise by one position.

ATTENTION! Never move the tracking system (table) manually. This might damage the instrument. All movements must be performed with the [Turn Table] function.

NOTE: Opening the chemagic 360-D instrument door while the automated extraction run is ongoing, will terminate the run and the samples in process may be lost.

Position	Material in position	Protocol step in detail
1	chemagic Tips 96 Tray	Use disposable tips according to the positions of the samples and place the chemagic Tips 96 Tray. Note: Tips need to be present in the Tray in full rows.
2	chemagic Low Well Plate with 100 μ L Magnetic Beads	Pipette 100 μ L thoroughly resuspended Magnetic Beads in each well in use according to the sample plate and place the plate.
3	Sample plate (chemagic Deep Well Plate 2 mL)	Place the plate with prepared samples (up to 400 μ L sample) and 10 μ L Proteinase K. Lysis Buffer 1 and Binding Buffer 2 are dispensed in the plate automatically.
4	chemagic Deep Well Plate 2 mL	Place empty plate. Wash Buffer 3 is dispensed in the plate automatically.
5	chemagic Deep Well Plate 2 mL	Place empty plate. Wash Buffer 4 is dispensed in the plate automatically.
6	chemagic Deep Well Plate 2 mL	Place empty plate. Wash Buffer 5 is dispensed in the plate automatically.
7	chemagic Deep Well Plate 2 mL	Place empty plate. Wash Buffer 6 is dispensed in the plate automatically.
8	chemagic Deep Well Plate 2 mL with 100-300 μ L Elution Buffer 7	Pipette (100-300 μ L) Elution Buffer 7 in each well in use according to the sample positions and place the plate.

17. PERFORMANCE CHARACTERISTICS

17.1 LINEARITY AND RECOVERY WITH SPIKED DNA SAMPLE

To show linearity of the extraction with the IVD-1091 kit, 0.9 % NaCl solution was spiked with five concentrations of human genomic DNA; 3 µg, 5 µg, 10 µg, 12 µg and 15 µg. Extractions were performed using 400 µL of the various DNA amounts as sample with the extraction protocol “**chemagic BBS DNA 360 H96 prefilling VD190913.che**”. Four replicates of each DNA amount spiked in 0.9% NaCl were extracted.

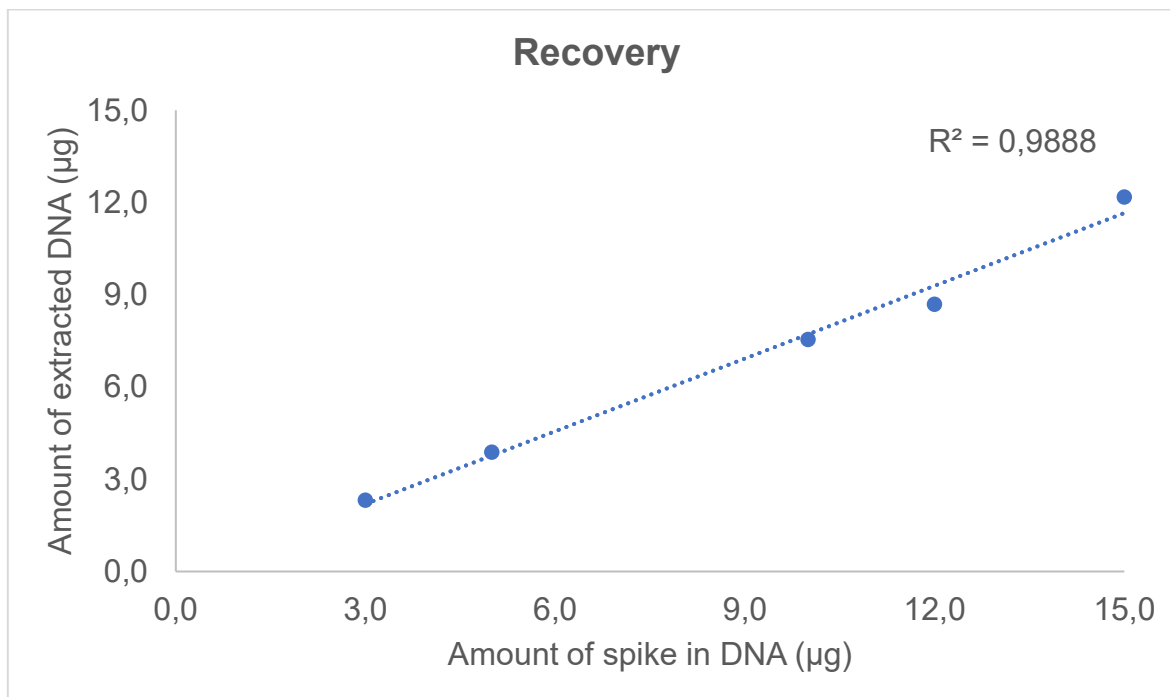


Figure 1: Extraction recovery of spike in DNA samples. Extracted with the chemagic 360-D using the IVD-1091 kit.

The recovery shows a good linearity in the range of 3 – 15 µg of DNA as sample input. The recovery ranges between 72.5 and 81.2 % depending on the input amount of human genomic DNA. The expected yields and linearity might be different for various blood samples.

17.2 DNA YIELDS WITH BLOOD AND BUFFY COAT SAMPLES

The expected DNA yields for the extraction from human blood and buffy coat depend on the number of white blood cells. The number of the extracted white blood cells is determined by the input volume and the white blood cell count (WBC). For most of the samples the white blood cell count will not be known, but for healthy individuals it is in the range of $4 - 10 \times 10^6$ white blood cells per mL of blood. The IVD-1091 kit using the “**chemagic BBS DNA 360 H96 prefilling VD190913.che**” protocol extracts in average 4.52 pg per white blood cell. Using 400 μ L of blood with a white blood cell count of 8.6×10^6 white blood cells per mL of blood as input is expected to result in 15.5 μ g DNA.

Table 1: Average yield ($\bar{x}$ yield), %CV (standard deviation) and average purity ($\bar{x}$ purity) of extracted DNA using the IVD-1091 kit extracted with the chemagic 360-D.

Sample Material	Storage [°C]	Volume [μ L]	WBC [10^6 cells/mL]	$\bar{x}$ Yield [μ g]	CV [%]	$\bar{x}$ Purity [A_{260}/A_{280}]
Blood 1	4	250	5.5	6.0	7.6	1.83
Blood 1	4	400	5.5	10.6	10.6	1.94
Blood 1	-20	400	5.5	9.2	10.6	1.92
Blood 2	4	250	4.9	5.7	7.7	1.83
Blood 2	4	400	4.9	9.5	11.5	1.93
Blood 2	-20	400	4.9	8.7	10.2	1.92
Blood 3	4	400	8.6	15.1	15.7	1.92
Blood 4	4	400	8.9	16.5	12.5	1.92
Buffy Coat*	4	400	8.6	51.5	16.1	1.90
Saliva	RT	400	n.a.	5.9	9.6	1.71

* Buffy Coat was generated from 2 mL of Blood 3 stored at 4 °C and frozen at -20 °C until use.

From all extractions including different sample materials, storage conditions and input volumes, specific eluates were used in a human albumin qPCR to prove the suitability of the extracted DNA for enzymatic reactions. All eluates performed without any issues - see example qPCR plot below.

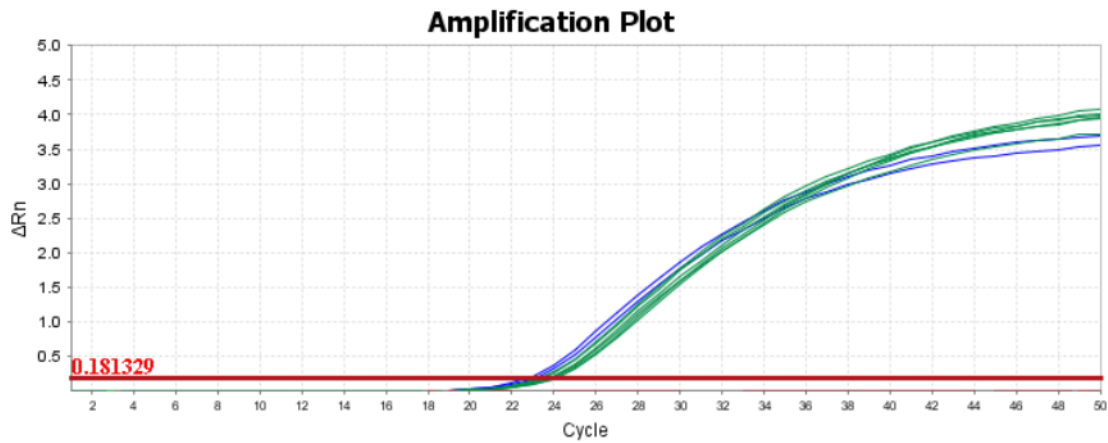


Figure 2: qPCR Curves of DNA eluates extracted with the chemagic 360-D using the IVD-1091 kit. Red - negative control, blue – positive control, green extracted DNA from Blood 3.

18. CLEANING AND MAINTENANCE

Cleaning and maintenance of the system is described in detail in the chemagic 360-D User Manual. The system cleaning is performed once per week. Clean the chemagic Dispenser as follows.

- Select the protocol **“regular cleaning procedure 96 dispenser 360 V150116.che”** and press [Insert IDs] or [Start] if the enhanced functions are deactivated. Follow the instructions given in the software.
- Prior to the next use of the chemagic Dispenser perform the appropriate priming protocol.
- The cleaning of the chemagic Dispenser with 70 % ethanol is recommended once per month. Simply use the **“intensive cleaning procedure H96 dispenser 360 V150116.che”** instead of the regular one for this purpose.
- If the chemagic Dispenser is not used for longer periods, it is mandatory to perform the "regular cleaning procedure" to maintain the performance of the instrument when bringing it back into service.

19. DOWNSTREAM APPLICATIONS

The following downstream applications were successfully performed and described in literature after isolation of genomic DNA.

Table 2: Peer reviewed and published downstream applications.

Sample Material	Downstream Application	Title	Reference
blood	genotyping, DNA methylation assay, PCR, Sequencing	Identification of dynamic glucocorticoid-induced methylation changes at the FKBP5 locus	Wiechmann et al. Clinical Epigenetics 11 Article Number 83 (2019) https://clinicalepigeneticsjournal.biomedcentral.com/articles/10.1186/s13148-019-0682-5#Abs1
blood and swabs	PCR, qPCR, library preparation, sequencing, NGS	ABO allele-level frequency estimation based on population-scale genotyping by next generation sequencing	Lang et al. BMC Genomics 17, 374 (2016) https://bmcbgenomics.biomedcentral.com/articles/10.1186/s12864-016-2687-1
blood	PCR with access array system, library preparation, sequencing, NGS	Cost-efficient high-throughput HLA typing by MiSeq amplicon sequencing	Lange et al. BMC Genomics 15, Article number: 63 (2014) https://bmcbgenomics.biomedcentral.com/articles/10.1186/1471-2164-15-63
saliva	genome sequencing, qPCR	Genetic Effect of Chemotherapy Exposure in Children of Testicular Cancer Survivors	Gregory V. et al. Clinical Cancer Research Volume 22, Issue 9 (2016) https://aacrjournals.org/clincancerres/article/22/9/2183/79766/Genetic-Effect-of-Chemotherapy-Exposure-in

20. FURTHER QUESTIONS

For further application, technical questions, or more information on how the data was generated please contact support.chemagen@revvity.com or +49 (0) 2401805500.

21. LIMITATIONS OF THE PROCEDURE

The IVD-1091 kit is validated for the automated extraction of DNA from blood, buffy coat and saliva on the chemagic™ 360-D instrument. Other sample materials such as tissue, cell or buccal swab lysates may be compatible but have not been validated. For such materials, validation must be performed by the user.

The use of heparin-stabilized blood samples can cause inhibition in downstream applications and is therefore not recommended.

22. INFLUENCE OF INTERFERING SUBSTANCES

The effect of interfering substances contained in human whole blood possibly interfering with the DNA extraction were tested in whole blood. The tested substances and concentrations are presented in table below. Based on the results, it was concluded that the tested substances do not interfere with the DNA extraction.

Table 3: Influence of interfering substances.

Interfering substances	Concentration [µg/mL]	Interference
Bilirubin conjugated	332	No
Bilirubin unconjugated	200	No
Triglycerides	30	No
Human Serum Albumin	30	No



WARRANTY

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